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THE TEMPLE PRIMERS

PRIMITIVE MAN

Translated from the German of

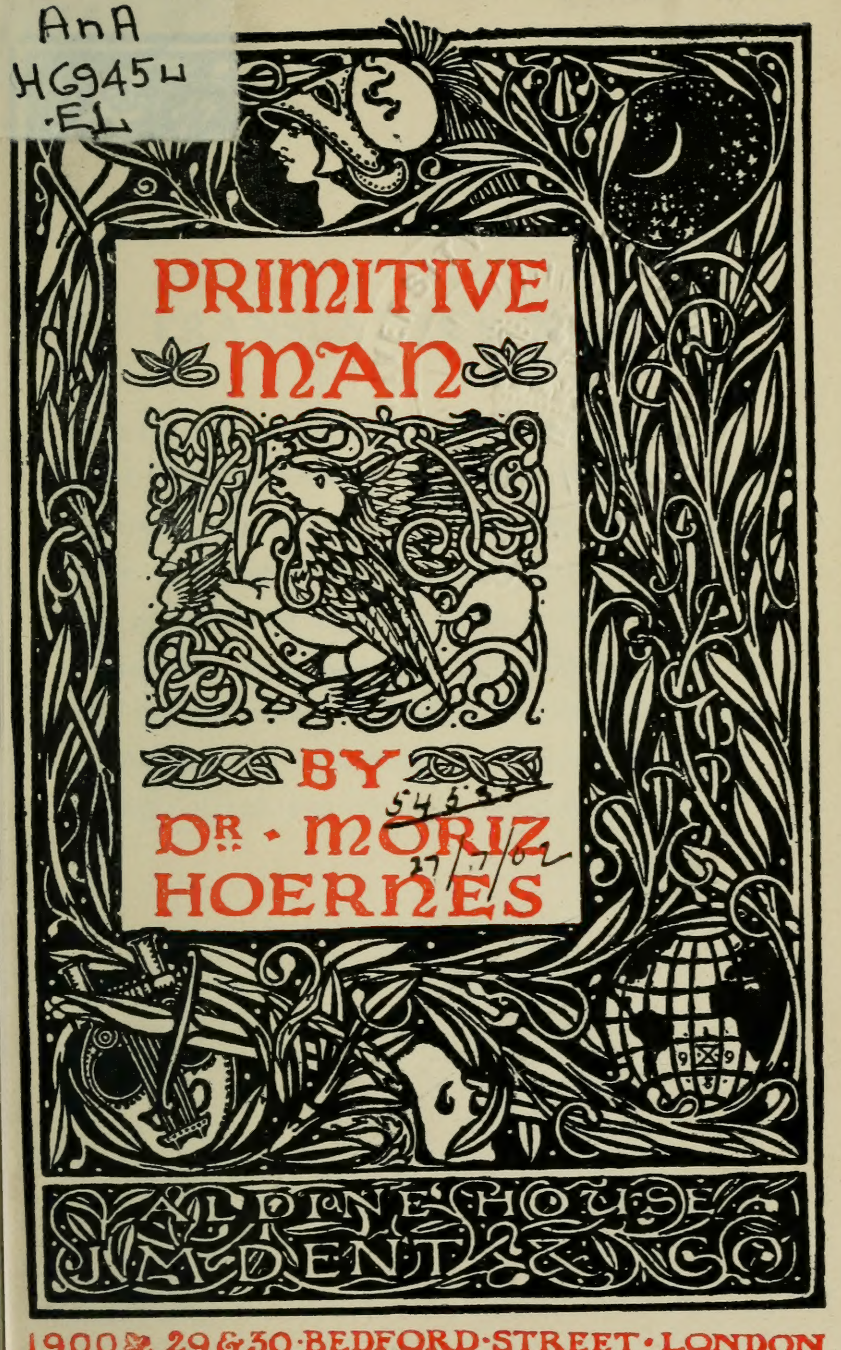
DR MORIZ HOERNES

By

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TRANSLATOR'S NOTE

WITH the object of avoiding any possible misunderstanding of Professor Hoernes' meaning, I have frequently preferred erring on the side of literality, and in cases where the English equivalent might not be perfectly clear to readers of a popular work, I have attempted to overcome the difficulty by giving in the form of notes the explanations of well-known authorities, such as Lord Avebury and others, whose books I freely and gratefully consulted in the course of my labours.

J. H. L.

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PRIMITIVE MAN

1. What is understood by Primitive History.

Primitive History, or Prehistoric Archæology, treats of that period of man's past concerning which we possess no historical records. All over the world and in every country we meet with a certain number of single facts anterior to what we may term reliable tradition, which do not allow of the construction of a connected story upon the basis of names and dates. It is the task of the student of Primitive History to discover the connection between them and throw more light upon their origin.

Whilst, on the one hand, Primitive History forms a chapter of Anthropology (the general object of which is to explain man's place in Nature), on the other, it widens our horizon beyond historical limits and describes the infancy of mankind. It originates with the history of the earth, and forms a connecting link with the history of mankind.

2. Man's Place in Nature.

Our own planet originally detached itself from the sun in the form of a loose gas-ball, and entered on its new path equipped with the same chemical matter as all other planets. It became incandescent, hurled its satellites into space, and gradually cooled down. Formerly surrounded by a thick atmosphere of vapour, it subsequently attracted the aqueous and other matter contained therein. Seas formed, and after an inconceivable lapse of time the *seeds of a new, differently conditioned life* germinated in their depths. No definite date can be assigned to the beginning of this phenomenon, nor

would an observer of the process have been able to perceive it; here and there, vital activity of the lowest order must have set in and the propagation of the primitive beings thereby generated was carried on by a process of disintegration. The formation of further organisms was continued from and out of these, advancing to the highest types at present in existence.

In the development of these living beings the high standard attained by man is such that we can only form a correct opinion of it from a suitable distance, as it were, by stepping out of ourselves and out of our natural powers of perception. Millions of years elapsed from the creation of the world to the appearance of the primitive organisms which are still living, and further immense periods of time glided away until the age of the fossilized remnants belonging to animals, which at that time already must have been of a highly organised nature. No fossilized remains, however, can prove by an absolutely complete chain of evidence that these living organisms derived their origin from one single, simple prototype. Recourse must be had to Comparative Anatomy and to the history of the development of present existing plants and animals. The quantity of matter precipitated by organic life and higher vital activity is insignificant in comparison with the totality of earthly matter. A modern naturalist has aptly compared it to the delicate bloom on freshly gathered fruit which a simple touch of the hand can disperse. Nor can the date of the *first appearance of man* on earth be definitely fixed. To do so in the face of the gradual development of mankind would be of no value or importance to the problem. The space of time which has elapsed since the Pliocene, or last epoch of the Tertiary period where we may locate the "first man," embraces, possibly, but a fifteenth of the sum of all terrestrial epochs represented by fossilized remains, and scarcely a fiftieth part of the effluxion of time since the beginning of organic vitality.

The cosmogonies, *i.e. the theories concerning the Creation*,

among all nations, represent man as having been created by a supernatural act, and the Creator himself as a human being, because minds capable of such reasoning could not imagine a thing which has "come into being" otherwise than as having been "made or created." On the other hand, science teaches us to regard the highest form of mammals as our nearest blood-relations, whilst Anatomy and Embryology expose to our view the hereditary proofs of the animal origin of mankind; and although fossil proofs of the transition are still wanting, we need not feel discouraged, since evidences of this particular nature have only recently been found worthy of attention, and even then only in a comparatively small area.

Physically, intellectually, and morally the *animal creature* has attained a high degree of perfection. All the organs of the human body have been gradually developed in animals as necessary and dearly-bought adjuncts adapted to their particular condition of life. The same is the case with their intellectual capacity. The higher the organisation, the more varied and complicated is the response to exterior provocation or "expression" of susceptibility or sensibility which exists even in the lowest animalculæ, and is in reality nothing but the consequences of their formation out of easily decomposable, chemical combinations. The brain consists of an accumulation of nerve-cells, and increases in size according to requirements. The plaster-casts of skulls of extinct animals prove that the latter possessed a very small brain. Nor should the moral feelings of a highly-developed animal be underrated. Maternal love is a hereditary impulse in animals, the propagation of which is absolutely dependent on the care of the young. And equally social vices—as vanity and lust of power, and social virtues, as generosity and faithfulness, which lead to the foundation of families and societies—are developed and maintained for the sake of their utility. The first dawn of specifically human development is to be recognised in the upright position. Whilst apes, with the exception of baboons, live in trees and are adept climbers,

primitive man must have lived in rocky, treeless places. Apes use their front and hind extremities for the self-same purpose of grasping and climbing. Even anthropoids can only walk upright a short distance, and then only with a great effort. And it is in this respect that the superiority of the human body is made apparent, for as soon as a child has ceased using its hands for moving from one place to another it has already secured a high position in creation.

Among created beings organisms which possess special limbs for special purposes are of a superior class. Creatures of a lower order employ one and the same organ for various functions. Whilst we use both jaws for crushing and chewing food, other animals employ them for grasping and defensive purposes, and some birds even for locomotion. We thus discover the latest degree of progress in the principle of division of labour and in the various modes of employing each individual organ, and a similar advance in the subsequent divergence between weapon and implement, decoration and dress. The same may be said of savage nations, like our northern ancestors who were led by climatic influences to brew beer from the white crop and to eat the fat of animals, whilst cultured southern nations despised beer and butter, but derived intoxicating drink and the fat required for their food from the vine and the olive-tree, the symbols of a higher civilisation.

Primitive man was therefore endowed with freedom both of arms and hands which he might use as organs of touch and implements of work. His upright position secured him a wider view. He could move his head more easily, whilst of all his senses, sight gained that superiority which had been previously possessed by smelling and hearing. The chest, being freed from the pressure of the bowels, was now in a condition to develop the organs of speech, and the influence of speech on the power of thinking was greater than can be imagined. The intellectual possessions of the individual were now not only transmitted to his descendants, but were spread and disseminated by the process of intercommunication. In

the opinion of ancient philosophers, man is distinguished from animals chiefly by the manner in which he judges the objects of the exterior world, and by the opinion he forms of them; in other words, by his powers of perception and remembrance. Consequently, his actions appear more and more not as a mere reflex, but as the outcome of an intellect peculiarly his own.

The true worth of *Society* is now for the first time recognised. In the "home"-life of savages (if we may be permitted to use the term) the injurious instincts of selfishness are brought under continual restraint, in the first instance, by the female. Already on the lowest rung of the social ladder, the sense of duty, *i.e.* conscience, makes itself felt in the form of some obscure consciousness. Conspicuous qualities and useful acts on the part of single individuals in the warlike life of tribes give rise to differences in rank, such as royalty, aristocracy, and commoners.

However great the number of races of mankind known to Ethnology may be, it is highly probable that they all had one common, original prototype which developed into several species by the persistent augmentation of the trifling influences of chance or climate. (Monogenistic theory.) The unity and uniformity of the human species is a fundamental law of Anthropology. Comprehensive comparisons prove that man ever followed the same intellectual impulses and fell into the same strange errors.

Where should we seek the *primeval home of mankind?* Opinions, even of the best known authorities, differ considerably on the subject. They hesitate between North America, Europe, Southern Asia, and Australia, thus variously following diagonal lines right across the globe. Whereever the original "Eden" of the Bible may be, it required extensive migrations to account for the distribution of mankind all over the world. Such migrations cannot possibly have been rapid, carefully-planned journeys or colonising enterprises, but a slow progress, halting often and long, following the uneven course of river-valleys and sea-coasts, rarely

crossing mountains or streams. Primitive savage hordes were more contented and more capable of resistance than we. They knew nought of the inexorable law of mortality. Many a tribe may have died out to the very last man, but they were followed by others who were better equipped, and thus were Nature's terrors overcome by obstinate insistence on the part of man, the all-overpowering product of her own creation.

Like the various countries of the world, all differently endowed by Nature, so the various human groups, temporarily or permanently settled there, also differ in point of individual fortune and lot.

The geographical position, configuration, and strata of the various portions of the globe collectively and individually, in conjunction with the characteristics acquired by the people in previous settlements, *decided the destinies* of their inhabitants. The oldest areas of higher civilisation were countries with mild climates, fertile soil, passable roads, favourable boundaries towards neighbouring territories, and sufficiently extensive to admit of many people living together under the same conditions, as in large riverlands. Thus, Egypt, Mesopotamia, the East Indies, and China emerged early from the list of countries of poor culture. In the New World, Mexico and Peru left the Indian areas in the north and south far behind, and in Europe the low-lying lands of the Po and the Thracian rivers, of the Garonne and the Loire, exhibit a more civilised and friendly character than other districts. In close proximity we often meet with areas which subsequently attain historic importance, but which by virtue of their apparently uninviting nature demanding some particular effort, urge on and eventually qualify their sturdy inhabitants for higher deeds. Such countries are Phœnicia, Hellas, England, North Germany, Scandinavia, North America, the Malay Archipelago, and the Islands of Japan. Between the primeval home of mankind and the settlements in which we now find its individual groups, are situated the ancestral seats of the latter, *i.e.* the areas in which the

various races of mankind and their subdivisions sufficiently developed their physical and intellectual characteristics to enable us to recognise them as separate members of the human race even at that particular era. Frequently we can identify the ancestral home with the modern home. Sometimes the former is as distinct as the primeval home of man itself. In this manner the original home of the Aryans has been sought in various portions of Europe and Asia, whilst that of the Semites also awaits final location.

The large groups called races are scarcely to be distinguished from one another with absolute certainty. The only value so far attributed to the classification of the races is to mark and distinguish the most conspicuous differences. Thus Linné distinguished four races according to the four largest divisions of the globe: the Americans, the Europeans, the Asiatics, and the Africans, to whom he ascribed different temperaments, colours of the skin, characters, and habits. Blumenbach assumed five races: the copper-coloured Americans, the white, red-cheeked Caucasians (Europeans); the yellow Mongolians, the chestnut-brown Malays, and the dark-brown Ethiopians; the formation of the skull being also taken into consideration. Others, like Huxley, formed their system purely on physical characteristics, with special regard for the various formations of the hair of the head.

That little is proved by language, culture, and dwelling is shown by the negroes of North America, who speak English and dress in European fashion. Nor is the population of Europe of uniform origin, although at the present day they mostly speak Aryan (Indo-Germanic) languages.

3. The Characteristics of Human Culture.

However much man may have in common with animals, science, to be true to herself, cannot fail to recognise in him, wherever he is met with, even on the lowest rung of the ladder of civilisation, a creature equipped with an abundance of higher distinguishing features. Amongst such earliest

possessions of mankind, language stands out in bold relief. The "alalus," the speechless primitive man, only exists in the theory of development. The language of animals communicates facts which are the reflex of perception, whereas the language of human beings transmits the results of knowledge. We are unable to discover a primitive language of man; indeed, it is permissible to doubt whether one ever existed. At the present day, mankind is divided according to construction of language into several large groups. We distinguish *monosyllabic* languages like Chinese which only consist of roots of words; *agglutinative* languages in which the sense is defined by suffixes to the roots, like the Ural-Altaic idioms; incorporating languages which enable the American aborigines, for instance, to build up a single word out of a confused mass of thoughts; and finally, *inflected* languages like those of the Semites and Aryans, to whose highest degree of development the construction of their language bears ample testimony.

The word-root is in itself useless, but, when inflected and transformed, serves as valuable material for the artistic construction of an equivalent for the sense intended.

Originally the language of human beings was very poor in words, a fact which is proved by the lack of the higher numerals among many primitive tribes, and the absence of general expressions, such as "animal," "tree," &c., in languages which otherwise possess good equivalents for individual animals and trees; further by the scant stock of words of which even our own lower classes avail themselves, and which represent but a modicum of their entire treasury. Language grows in proportion to its higher ideals, to its accumulating reserve of thoughts, and to its perfected manner of expression. It being impossible to imagine a primitive man without speech, we are equally precluded from picturing to ourselves a human being of the earliest epoch of time without some religion. Religious impulses belong to the earliest possessions of mankind. They are as necessary to man for the purpose of satisfying the ineradicable impulses of

his mind as the expression of his thoughts through the medium of speech and the decoration of his body. The object of endeavouring to ascertain the reason of these phenomena is to be explained by the desire to influence their manner of coming into existence. This, at least, was the original intention. Incapable of cold, dispassionate observation the child of nature sees in a chance incident, in an independent sequence, the desired causal connection between two circumstances, and yields to an unimportant matter or proceeding in order to influence that which, in his judgment, is important. Thus that which is lifeless is regarded as animated, and as the creed of the ignorant is not very complicated he finds himself engulfed by a surging mass of higher forces which drag him down to the level of a slave of his own unbridled powers of imagination, instead of standing at the end of a long chain at the other extremity of which there appears to him the Unity of a grand Creator of all things!

In the present enlightened times we call this lamentable condition of mind Superstition. It was the source of anxious longing on the part of man to know and understand the powers that surrounded him, and it developed and assumed ever changing, higher forms. He abandoned the worship of the Fetish for the higher adoration of visible, working powers, such as water, fire, and animals. His religion rose to a service of the planets, and he finally recognised an only God in yet higher spheres far beyond human ken and the limits of science. In animals we note the instinctively special form of the herd: Human Society rests more firmly on the family. The latter is the nucleus of the State, the foundation of the large groups of families, the original "stock" with an existence based on legal guarantees. The sense of possession, or the idea of property, unknown to animals, was early developed in man. It acted in him as an incentive, and enabled him to look forward beyond the immediate present to an assured future. In the "stock" of the Family and the State man discovered the foundation on which he might usefully put into practice the desire inherent in him

to yield to a superior power. His religious impulses were also successfully transferred to this area. His most ancient divinities were the gods of his tribe (defunct kings), or family gods (ancestors). Class-distinction in the State led to division of labour, as well as to the competition of individuals in life's battle for power and dignity. In permanent settlements the sense of tribal connection was strengthened by man's affection for the soil to which he was accustomed; in other words, by his patriotism. Man grows up in and with his surroundings, animals never. He requires to be in sympathy with others. The inner solitude in which animals live their life is unbearable to man. In the primitive days of man's material existence he lived on the edible matter which he collected promiscuously, without intentional limitation to vegetable food, from Nature's storehouse, or by hunting. But as soon as he had laid the foundation of a higher development, he possessed himself of useful animals, plants, and herds, and occupied himself with tilling the ground, *i.e.* agriculture and cattle-breeding, both industries showing marked progress in the nature of man's occupation. His longing for society led him early to include animals among the dwellers in his hut or tent, and among the playmates of his children and his own associates in leisure hours. He tamed the young of wild game, and taught them to recognise a certain connection with the family, and through it also an assured future otherwise denied to animals. The dog was his comrade, his partner in the chase, the guardian of his flock. In agriculture we can also see the same gradual transition from a simple acceptance of Nature's gifts to the creation of a systematic plan by which her store-houses might be widened, her treasures wrung from the bowels of the earth, and safely transferred to the granaries of the husbandman. Nomad tribes frequently settled temporarily in certain localities at the time of the ripening of the fruits, and kept their market-festival like the tillers of the soil. Stocks of seeds were taken from wild plants, and carried along by the tribes during their wanderings, by which means various descriptions of grain and other field produce which were

capable of cultivation, became known far and wide. The earliest agricultural implements were so primitive, that we should nowadays scarcely know what to do with them. But as a matter of fact, they were not used then in the same way as we employ our much more perfect implements now. The cultivation of the soil lay in the hands of the women. With great effort—and then only superficially—a piece of land around the dwelling-place of the family was sown with seed, and abandoned immediately after the harvest was over, whereupon the wandering tribe passed on again.

In the earliest times man was well acquainted with fire, which animals fear and avoid. Man is a fire-kindling being, and, in a sense, fire is the mother of all higher civilisation. Fire favours the desire for society. Around it centre the delights of the domestic hearth: in it arts and crafts find their strongest helper: it cooks the food, it burns out the forest roots, it fashions the tree-trunk for the boat, it points the piles for lake-dwellings and spears for the fight, it scares away the wild animals, it beats up the game for the hunt, and overcomes the unbending metals.

The use of fire now made it necessary to dig a hole, or erect a hoarding, to enable the protected flame to burn steadily. Such was the prototype of the shelter which, however, was also called into existence and conditioned by other dangers and requirements. When primitive man in tempestuous weather took shelter in hollow trees, or caves, according to the nature of the locality, there lay concealed in these hospitable retreats, unintentionally offered him by nature and chance, the fruitful seeds of a long, high-soaring civilisation, to which the first steps led through the medium of imitation. By knitting together branches of trees and leafy bushes the natural shelter of the forest could be artificially enlarged and more firmly established, whilst caves could be fortified by surrounding them with pieces of rock, or they could be independently imitated. In a similar manner the natural growth of trees was replaced by piles rammed into the ground, and as a result the huts became either circular or square in form,

according as the piles were gathered together at the top into a point and bound with brushwood, or erected perpendicularly, with cross-beams placed over them, and covered with roofing. The former constitutes the circular hut, forming its own roof. In order to stand upright in it, it was necessary to dig a hole in what we should call the flooring, in the centre of which the hearth-fire burned. Tent-like huts of this description could only be of a permanent nature in localities in which man was not exposed to sudden inundations, as, for instance, on hill-tops. Where these misfortunes were to be feared, man erected the "pile-hut," which allowed for a dwelling-platform a little above the soil. But as man could not exist without water, and its immediate vicinity offered great advantages, he soon learnt to erect his hut on the very edge of lakes and rivers, indeed, even on and in the water itself, and to live and lord it over the watery element as a "pile-farmer."

It is characteristic that in man's primitive condition clothing was less the outcome of the necessity of protection from exterior influences or of considerations of modesty than of his craving to make his person appear more pleasing by all sorts of suitable additions. Thus clothing clearly originated in man's desire for ornament, a desire which is so evident in the world of to-day that we only take pleasure in fashions which adorn, or at least are supposed to adorn, our person. It is another mark of distinction between mankind and animals, and the more arbitrary the form of adornment appears to us by which he endeavours to mark his peculiar nature, the more important is the difference. The "child of nature" attaches most importance to his exterior appearance. He is comparatively more extravagant in the matter of luxuries than the rich citizen of civilisation, who never fails to catch the savage by means of cheap jewellery, a bait eagerly held out and as eagerly taken. We shall therefore not be surprised to find primitive man better equipped with decoration than with clothing. Our sense of modesty is frequently offended by the appearance of the

savage, although in the case of dark-skinned people many things appear more bearable in our eyes than their description leads us to imagine. But primitive man never infringed the prohibition to appear without ornament; for ornament was equivalent to distinction, and in the earliest stages of culture no one desired to appear without exterior distinction. Ornament was equal to riches, since it frequently constituted a man's sole possessions. Much decoration signified a well-filled purse, for the ornaments mostly in use were the representatives of money, for which more useful articles were exchanged. Nor could a more secure place for them be found than on the person of the owner. For this reason the most ancient money recognised as European has the form of rings (see Fig. 2). They are recognised as current coin by the fact that they are all of different weight, whilst an additional proof is furnished by the circumstance that they are held together by another ring which takes the place of the purse.

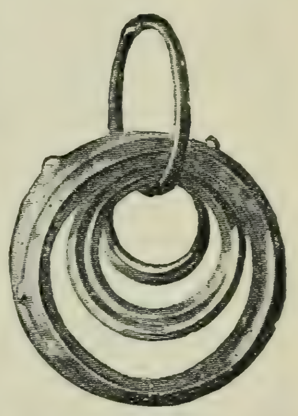


FIG. 2.—Ring-Money of the Bronze Age (Moravia).

But there were other ornaments in addition to the foregoing. There were the decorations which man paints on or incises in his own skin. The savage heroically suffers the torture of tattooing in order to stalk about with coloured curves and arabesques on chest and shoulders. Even if this fashion loses its value as an article of barter and exchange, it retains its higher importance as an exterior mark of distinction. The scars or painting denote the tribe and family of the wearer, the battles in which he was engaged, the enemies he has killed, the relatives he has lost by death, and other personal matters. But it was not only the skin which served the purpose of writing material for the first record of human pride. In other parts of the world they file down the front teeth, break them out entirely, chop off fingers,

pierce lips, nose, and ears, introducing ungainly plugs to fill the holes, or finally prepare their hair in grotesque "buns" and strangely-pointed crowns. All this entails much personal inconvenience, but man submits to it as willingly as he does to any national fashion so long as he gains his object, which is to stand out conspicuously as an individual, or as a member of a whole group of select ones in striking contrast to those who are not like him. The same reasoning underlies the action of a nation in calling itself by a name which terminates in the syllable "man," to denote that only its own people are "men," whilst a less honourable nomenclature is attributed to other nations. If clothing and ornament, which are almost inseparable, constitute a distinguishing mark between man and animals, the same may be said of weapon and implement. The stone axe of the savage was whetted for the skull of the enemy as well as for the trunk of the tree, the missile of the hunter was aimed at the stranger to the tribe as well as at the object of the chase. Peaceful work and war were not in so sharp a contrast then as now, and consequently possessed partly the same implements of execution. That man, a being so poor in natural means of defence, should have been able in the fight for existence not only to maintain himself, but also to gain superiority over animals, must be ascribed to what we call the "projection of the organs." Physically weak, but strong of intellect, man delved into Nature and extracted from her the means of strengthening his own organism. The prototype of the implement was found when primitive man endeavoured to imitate the functions of his own body, and continue them outside and beyond his own person. The bone of the arm and the fist suggested the club; the tooth, the chisel; the row of teeth, the saw; and the finger and sharp nail, the awl and scraper. With the prototypes once in existence, there was no further difficulty in developing an endless number of wooden, bone, horn, stone, and metal implements and weapons, every design with its own numerous additions and modifications, down to the marvellous machinery

of modern times, which would almost appear to deny its parent. It is clear that, next to the almost ideal principle involved in the projection of the organs, the nature of the material out of which man fashioned his weapons and implements must have had a marked influence on their exact form. For this reason the earliest creations of man's dexterity were of the simplest type, scarcely distinguishable for a practised eye from chips, splints, or blocks formed by nature. This influence extends beyond the period in which primitive matter was worked up, and in which new and better material was known. Thus the ancient form of the flat stone axe was retained in bronze and iron with but few modifications for many centuries, and all inventions which emanate from the necessity of having a light but firm shaft or handle, or from the more malleable character of the metal, are directly traceable to their incomplete prototype.



FIG. 3.—Flat Copper Axe. (From the pile-dwellings in the Mondsee.)

Fig. 3 shows a copper axe from the Neolithic pile-buildings in the Mondsee (Lake of Mond, Moonlake) which only differs from the stone axe of the same period by the larger cutting surface. It had a wooden handle with a knee-bend (see Fig. 4), the shorter arm was split and able to take either a stone or a metal blade.

The latter was then furnished with hammered or cast ridges which, in the case of the "paalstab" (Fig. 5), deve-

loped the handle-lappets, which partly or entirely surrounded the split end of the handle.

In Fig. 5 the strings which otherwise bound the blade and the handle together are imitated in bronze.

Fig. 6 illustrates the so-called "hollow celt." Its handle-end is not slit, but fixed in an opening at the top end of the blade, another mode of replacing the string by a more durable material. The last two examples are taken from the grave-fields of Hallstadt of the Iron Age.

Fig. 7 represents a more recent example, the opening being at the back; its form is something between a paalstab and a hollow celt. This type is characteristic of the second prehistoric Iron Age, and belongs to the La Tène category. The figure shows a specimen dug out of the earth in La Tène itself, the well-known area of "finds."



Fig. 4.—Wooden Handle of a Paalstab (Hallstadt).

At the same time, but less frequently, we find axes like ours with a hole at the back for a straight handle. They appear in the latter Neolithic Age in the form of hammers of some softer stone, and look rather like ornamental axes. They are rarely to be found in the Metal Age. Should we meet with a piece similar to that shown in Fig. 8, made of stone (note the small hole intended for a thin handle), we shall not allow the nature of the material to lead us astray and ascribe the article to the Stone Age. Here the reverse is the case. An earlier material selected, perhaps, for religious reasons, has been influenced by a younger form which can only have existed in a different material, *i.e.* in bronze, which could only be cast. The article in question, therefore, must be of the Bronze Age. Fig. 9 belongs to the

earliest axes with pierced backs, and may be regarded either as a real weapon or as an implement. It dates from the last



FIG. 5.—Bronze Paalstab (Hallstadt).

FIG. 6.—Iron hollow Celt with handle-rest (Hallstadt).

FIG. 7.—Iron Axe with wooden handle (La Tène).

stages of the Hallstadt period, and shows a type of limited distribution in the grave-fields of the Eastern Alps.

Whilst animals are strictly bound to the natural area in which certain foods are obtainable and to suitable climates, man, assisted by the earliest forms of culture, soon spread all over the world. He thus came into possession of the various treasures of the earth according to the district in which they

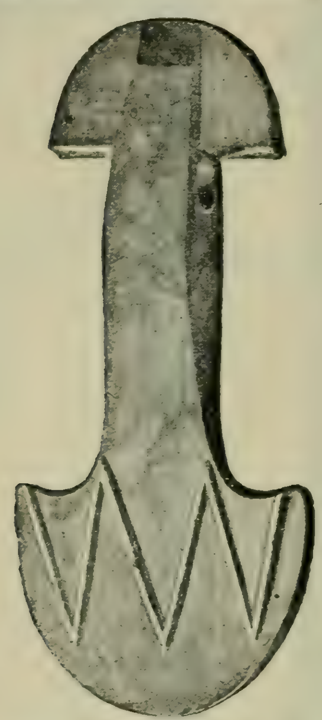


Fig. 8.—Ornamental Stone Axe (Denmark).



Fig. 9.—Iron Axe (Carnolia).

were indigenous, and the exchange of such products between the groups of people living in the different areas began at a very early date. This gave rise to communication among nations, and to commerce, exchange and barter, a civilising element in the savage life of primitive man, which softened the unbending, hostile seclusion of individual tribes, created mutual, peaceful relations, and inaugurated simple

treaties for their protection and maintenance. Primitive man had no sense of possession outside his own family and tribe. A stranger's property was for him nobody's property, which any one might seize if he were able. But later on he became acquainted with property which neither power, nor cunning, but only friendly arrangement with strangers could secure, and he straightway began to barter and exchange, either taking the necessary equivalent with him and obtaining the desired possession from afar in exchange, whilst observing some prescribed formula, or finding at a neighbouring settlement the goods which found their way from tribe to tribe, or finally satisfying his desires and requirements through the medium of the trader from distant lands under the protection of recognised laws of peace. In this manner coloured earths for painting the body, salt as a condiment in the preparation of food, hard stones for the manufacture of weapons and tools, shells, amber, and ivory for decorative purposes, later on metals, such as copper and tin, for the restoration of bronze, and subsequently iron were thus brought immense distances, and through hostile tribes, from the place where they were found to the localities where they were required. In some cases, it is true, relapses into the animal form of acquiring property take place. Trading caravans were plundered and sanguinary battles waged for the treasures resulting therefrom. These, however, are incidents, which are by no means limited to primitive ages, but have penetrated all historical periods. War and the assertion of the right of the strong exercises a form of communication between nations by which progress is effected or inaugurated. Wars lead to this result, even when they are waged, like those of savages against savages, for the purpose of utterly exterminating one or the other side; in any case the result is obtained more rapidly when the object is to spread some feature of civilisation, to spare the enemy and merely to insist on his acknowledging the supremacy of the victorious party. On the other hand, peaceful relations among nations of different degrees of culture and ideas of life have results

which the most sanguinary war fails to bring about, namely, the gradual dying out of the weaker party, a phenomenon which, in the case of large groups of men, is termed the extermination of races.

4. The Earliest Traces of Man.

Primitive Archæology is concerned neither with the question of the origin of man, nor with the considerations of the lowest types of culture in human beings; the former is one of the main problems of Physical Anthropology, the latter belongs to the ethnology of uncivilised nations. Its object is clearly expressed in the title; it is Archæology, pure and simple. It endeavours to discover the earliest traces of the presence of man on earth, and to base thereon a chapter of history concerning the state of culture which prevailed prior to the existence of written records.

Having once admitted that language is one of the oldest indications of primeval man, we are justified in saying that the age of prehistoric antiquities extends principally from the moment man became possessed of the faculty of speech to the time when he acquired the art of using a written symbol, an assumption which accounts for the indefinite era attributed to the beginning of the Prehistoric period and for its unequal duration in different countries of the world. The most ancient testimonies of the presence of man are lost in the obscurity of the past, and the Prehistoric Epoch of Culture, or that which lacks the substantial proofs of written records, lasted in some parts of the world thousands of years longer than in others.

We may reasonably seek man in the tertiary or penultimate period of the development of our earth, but there is nothing yet to show that he has actually been found there, nor has his existence been traced there with any degree of certainty. The same may be said of the earlier portion of the Diluvial period which constitutes the last stage of development in the history of the earth, although there would

seem to be scarcely any doubt that man did exist at that time.

The Diluvial or Quaternary period was followed by the Glacial period, when glaciers were widely distributed over almost every portion of the globe, and fauna existed and flora sprang up suited by nature to thrive under extreme conditions of cold. These periods of immense duration were again separated by others termed Inter-glacial periods, which had a milder climate, and therefore gave rise to the development of different forms of animal and plant life. In Europe, a large quantity of remains have been found showing that man existed there in the latter portion of the Diluvial period, and consequently his existence would seem to date from the first Inter-glacial and the last Glacial period, which may be further proved by the traces found in the calcareous tufa of Taubach, near Weimar, and by the Schussenried discoveries on the plateaux of Upper Suabia.

In the district of Taubach, after the older glaciers had retreated, man lived contemporaneously with animals of a milder climate. The principal representatives of the brute creation in Central Germany at that time were the elephant, the rhinoceros, the cave-lion and the cave-hyena, and later on we meet with modified forms of indigenous animals related to the foregoing, as the bear, the wolf, the beaver, the wild boar, the bison, the stag, and the roe. The Northern types of animals, as the reindeer and the smaller rodents, are, however, missing.

At the mouth of the Schussee, near Schussenried, man lived under very severe climatic conditions and in the midst of animals and plants of a Northern zone. Here on a moraine,[1] originating from the last European Glacial period, we meet with the remains of the reindeer, the red and the arctic fox, the whistling swan, the bear, the wolf, and moose from Lapland and Greenland.

The majority of Diluvial "finds" exhibiting traces of

[1] *Translator's Note.*—A moraine is an accumulation of sandstone and other débris found at the base and along the edges of glaciers.

man belong to post-glacial periods when the last masses of glaciers began their retreat; in other words, in Diluvial Europe. Man appears to have been more frequently coeval with the reindeer than with the mammoth, although it is certain that he was also contemporaneous with the latter.

The next question which most naturally suggests itself to our mind is: what did these traces of man look like?

They are, as the student may well imagine, of a very insignificant character. The state of culture of Diluvial man is termed the older Stone Age or the Palæolithic period. Both terms are synonymous, and indicate an epoch in which man employed stone as his material for making implements (although he also used a few other easily obtainable substances, such as wood, bone, and horn), and had already acquired the art of hewing and whetting it by hammering, instead of rubbing and smoothing it on a fixed base.

French scientists call this the "Epoque de la pierre taillée," in contradistinction of the "Epoque de la pierre polie," the later Stone period or "Neolithic Age," to which we shall refer later on. The two Stone periods are also taken together, and termed the "Pre-metal" period, as opposed to all the subsequent periods of the development of prehistoric culture.

But the former exhibit such great differences themselves that it is preferable to make a marked distinction between them. The above-mentioned difference in the manner of treating stone in producing weapons and implements is but a comparatively insignificant indication, and it is necessary to direct our attention to both periods in their entirety in order to grasp the immensity of the separate changes in the culture then possessed by man.

Palæolithic man knew neither agriculture nor cattle-breeding. He did not even know how to form vessels of clay and bake them. Nor would such knowledge have been of much use to him, for he lived a wanderer, a frequenter of deep caves or overhanging walls of rock which sheltered

his hearth-fire from the wind and his body from the cold. In the various pre-glacial, glacial, and post-glacial periods he hunted the denizens of the park-like meadow-land, the steppes, and the forest. In baited trap-holes and with spears he killed the woolly-haired mammoth.

In caves he found and fought the terrible cave bear, whilst the powerful ure (bos primigenius) and the bison (bison Europæus), which we now call the aurochs, succumbed to his arrows. The reindeer played an important part in the life of the huntsman, but his habitations rarely expose any traces of the elk or giant-stag. In the drift of rivers and brooks, or in the mountains where stone was near at hand, he found quartz and quartzite, lime and sand-stone, horn-stone and jasper, especially the much esteemed flint-stone, the favourite material for knives, scrapers, borers, awls, axes, arrow-heads and spear-points. The selection of appropriate pieces was quickly followed up by a simple, but clever mode of treatment.

Long and strong splinters or flakes as keen as a razor, and of prismatic form (Fig. 10) could be detached from a larger block by a single blow of a round pebble (Nucleus, see Fig. 11).

Even in the Neolithic period they could not make a different or better knife.

If a scraper was required for cleaning the skins of animals, or for treating wood or bone, a rather thick blade was taken, and by pressing some wood or bone implement against its sides thin layers were chipped off and delicate facets produced, called "retouches" (Fig. 12). This method of "touching up" was employed less frequently in the earlier, but very often in the later Stone Age over the entire surface of the blade, and allowed of any

FIG. 10.—Flint Knife.

desired shape being given to the implement in process of formation.

This finer workmanship is not to be found on any of the most primitive forms of hammering implements produced by man, such as the large stone, almond-shaped axes, which were probably held in the grip of the bare fist, and swung

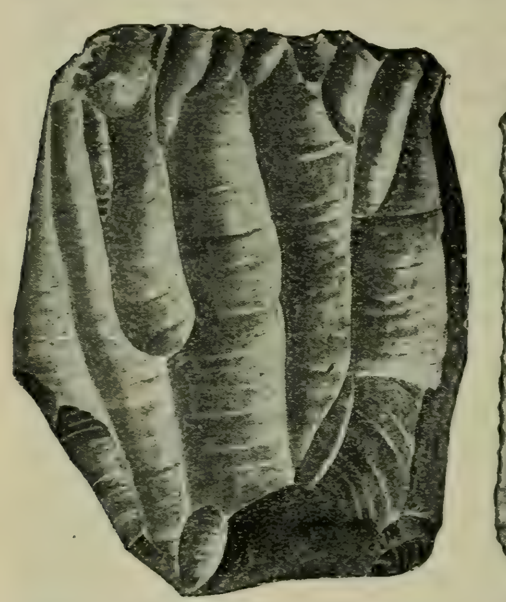


FIG. 11.—Flint Nucleus from which splinters —knives—were chipped off.

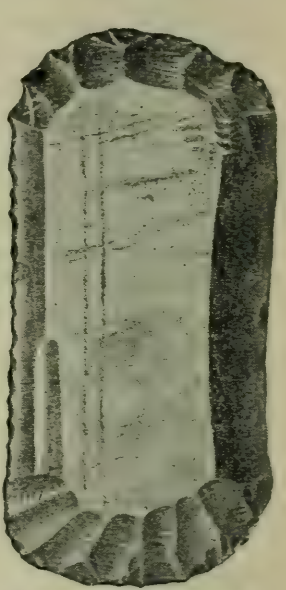


FIG. 12.—Flint Scraper.

round and only roughly hewn on both sides. The next stage shows this "touching-up" on one side only, namely, on that side which was not intended for grasping or for handles. Later on, implements of stone were touched up all round (Fig. 13), or the entire surface was treated in this manner.

Towards the end of the Diluvial period other substances, such as horn and bone (Fig. 14), seem, in some places at least, to have been preferred to stone, since the art of

smoothing and sharpening the more pliable material appears to have become more general. The softer substance, by reason of its pliability, also appealed to the artistic sense which now began to develop in man, for he exhibited a surprising, inborn talent for drawing and scratching pictures of animals or arabesques (Fig. 15) on bone surfaces and antlers.

The body was decorated with shells, and perforated teeth of wild beasts, threaded on strings, were hung round the neck. To this they probably added skin-painting or tattooing and conspicuous feather ornaments for the hair. Skins of animals were taken in their raw state or depilated, joined together with sinews, and then thrown over the shoulders. It required a strong hand to swing the spear for the chase. One end of the handle was split to receive the pointed end of the stone, and the two bound together by a sinew, and possibly further cemented with bitumen.

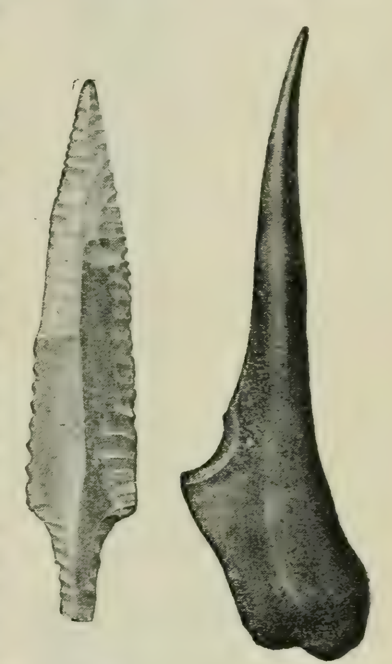


FIG. 13.—Flint Arrow-point.

FIG. 14.—Bone Awl.

The blade of the axe was similarly jammed in a wooden knee-shaped handle. Bows and arrows completed the equipment of these mighty hunters.

Barbed harpoons were made of horn and bone. The treatment of stone, vegetable, and animal matter was carried on in caves by the light of the hearth-blaze or on open spaces around their dwellings where the spoil of the chase was divided and the remains thrown away.

Stone-kernels, refuse, half-finished fragments and complete articles, undoubted proof of primeval industry, are still to be seen lying next to the coal and ashes of the hearth-fire and the broken, gnawed bones of animals.



FIG. 15.—Reindeer Antler, cut, perforated, and engraved.

As regards dwelling-places, a distinction was made between open and covered habitations.

Wherever caves existed, primitive man very soon discovered them, wresting them from the wild beasts and using them as dwellings, at least during the winter season. Caves were, however, not always available, and man could not live at all seasons of the year in their mouldy atmosphere.

Outside the cave-district he found natural hollows or sheltered spots which, with a little natural intelligence and physical labour, he was soon able to convert into habitable, though temporary dwellings. He was attracted to certain spots by the appearance of herds of animals which were the favourite objects of his hunting expeditions, or by the frequent discoveries of good material for implements or weapons.

It was in open settlements or encampments of this description that the celebrated finds of the valley of the Somme, in the north of France, were made, the first proofs of Diluvial

man. For these finds we are indebted to Boucher de Perthes, whose labours were not recognised and appreciated by the world of science until many years had passed in patient discussion. The rich layers of flint in the chalk of the valley of the Somme are one of the foundations of early culture in that portion of Western Europe. The bones found in the same layer of gravel next to axes, scrapers, and flint spear-points are those of the mammoth, the rhinoceros, the bison, the horse, the reindeer, the giant-stag, the cave-lion, and the cave-hyæna. Some of them show traces of the stone-weapons used for slaying animals and cutting them up.

Similar finds, the age of which can be fixed without any possible doubt, have been made in the loess [1] or loam of the valley of the Danube and in that of other river-basins of Central Europe, which now form vast, compact strata, owing their existence to the huge sand-drifts of the post-glacial period of the Steppes.

One of the encampments has been opened up in the vicinity of Willendorf, not far from Spitz, on the Danube, beyond Krems, in Lower Austria, where, running through the centre of a loam-wall or bank which had formed in the laying out of a brick-field, they found a dark, narrow strip, consisting of ashes, coal, and other organic matter, remnants of food of some primeval tribe, stone implements and fragments, all of which show proof of primitive industry and activity.

In the Diluvial caves already discovered we are frequently confronted with a higher degree of human culture than may

[1] *Translator's Note.*—According to Burmeister, "loess" is the term given in the district between Bale and Bonn to a mixture of loam, lime, sand, and mica.

The *Deutsches Museum* defines "loess" as a layer of loam belonging to the group of Diluvial strata.

Sir John Lubbock says:—"While the water had sufficient force to deposit coarse gravel at any given level, at a still higher one it would part with finer particles, and would thus form the "loess" which at the same time would here and there receive angular flints and shells brought down from the hills in a more or less transverse direction by the rivulets after heavy rains."

be inferred from the remains found in open settlements or encampments. In the former there are the curious carvings of the reindeer hunter of the Dordogne, and generally many proofs of greater intelligence. This has led to the conclusion that the open settlements belonged to the generation that lived in the pre-glacial period, and that the race of men following them in glacial and post-glacial times, or, strictly speaking, the Reindeer periods, were forced by extreme cold to search after caves, in which, in the stern battle of life, they also developed higher abilities.

We must consequently distinguish two degrees of Palæolithic culture: the Mammoth Age, a warmer preliminary or intermediate period, with open habitations on the plains; and the Reindeer Age, with a cold climate and better forms of implements derived from caves. But the mammoth was not restricted to the warmer periods. It existed also in the last post-glacial period, but more in open, well-watered districts, whilst the reindeer was to be found in hilly places. So it is possible that the two phases of human culture into which we separate the Diluvial period could very well have prevailed simultaneously in places which were far apart. On the banks of the Dordogne (Périgord, France) numberless grottoes are to be found on the rocky slopes of the valley. The foundation of these caves consists partly of calc-sinter, through which the relics of the ancient Troglodytes (cave-men) have been, as it were, baked together into a firm mass. In this mass are to be found coal and burnt stones, numerous stone knives, awls, saws, points of lances, axes, and remains of flint and horn—stone, needles, arrow-points, harpoons, daggers, articles made of bone, &c., carved out of reindeer horns, and a quantity of pieces of bone belonging to animals killed in the chase. Among the last-mentioned are recognisable those of the cave-bear and the giant-stag, the saiga-antelope, the wild goat, and the musk-ox. No animal remains are so numerous, however, as those of the reindeer, the horse, and the European bison. These animals afford the surest evidence, apart from the caves and the stratifica-

tion, of the Diluvial Age. In these very old remains we fail to discover manufactures in burnt clay (such as vases and the spinning-wheel), or any traces of cattle-breeding, agriculture, or stone-smoothing (bones of domestic animals, grinding-stones, whet-stones, and polished stone implements).

Verified proofs of the existence of Diluvial man are most numerous in Europe, where more serious study has been given to the subject than in any other part of the world. Traces have been found and verified in France, England, Spain, Portugal, Belgium, Germany, Austria, and Italy, but they are missing in those continental countries which did not become habitable until after the last retreat of the Glaciers. Thus no traces have been discovered either in Scandinavia, the greater part of North Germany, or in the Alpine district. Outside of Europe we meet with them in the Quaternary strata of Northern Africa (Algiers and Egypt), India (Deccan), and the Western North America. All bear the same indications, pointing to the fact that there must have been some very early beginning of industrial activity extending, in the first instance, to the treatment of the hardest description of stone within reach of man. Wherever the quantity of useful material at his disposal was scant, the implements and weapons were also of a smaller size, but the shape seems to have been everywhere the same and dates back to the Neolithic period.

The question might be asked whether amongst the earliest proofs of man's presence on earth any physical remains have been discovered, such as whole skeletons, or portions of them, or skulls of primitive human beings. Even if such remains do not extend further back than the Diluvial period, they will at least serve to give us some idea of the physical structure of Diluvial Man.

Was he more closely related to the brute creation than the generation of to-day? Could he have resembled in any way the present existing races of lower type? Was there one uniform type of man, and, if so, what were its features? Unfortunately the material at our disposal, our stock of

undoubtedly genuine Diluvial skulls and other portions of human skeletons, is too small to enable us to answer these inquiries with absolute certainty. The little that we possess originates almost exclusively from Europe, and could therefore only help us to reconstruct one or two European primeval races. All we can boast of is one single cranium found in a cave in the Neander Valley, near Dusseldorf, which has formed the subject of much discussion on account of the peculiar marks it bears, and of a few fragments of skulls and entire skulls from caves and quaternary strata in France, Belgium, Italy, Bohemia, and Moravia, as well as several skeletons from a cave near Furfooz in Belgium and from Cro-Magnon, in Périgord, France.

Without going into the question of the formation of these bone relics, it is clear that the Diluvial inhabitants of Europe can scarcely have belonged to a race of one uniform type, as we already find amongst them men with short heads (brachycephalic), and men with long heads (dolichocephalic). Moreover, all these human beings of whom we are now in a position to form an opinion, owing to the above-mentioned finds, were well-formed men who, judging from their physical structure, could have mixed among us to-day without being in any way conspicuous. They had no simian racial indications, their skulls were no smaller and their face had no animal formation. They were fully developed in every respect, and during the slow change which gradually transformed Diluvial Europe into the Modern Continent of the same name, some of them probably remained in their own country, whilst others left their primitive home and migrated northwards to hunt the reindeer in regions which had now become habitable for man and afforded him the same facilities of living as formerly the ice-free portions of West and Central Europe.

5. The Later Stone Age.

The transition from the last of the great epochs to the present period in the history of the earth was accomplished almost imperceptibly. Nevertheless when we consider the results in their entirety, the difference between the two is very great. In place of the cold dry atmosphere, which was a characteristic feature of the Reindeer period, Europe now enjoyed all the advantages of a temperate climate. The animal and plant worlds were in the main almost identical with those of modern times. The mammoth and the cave-

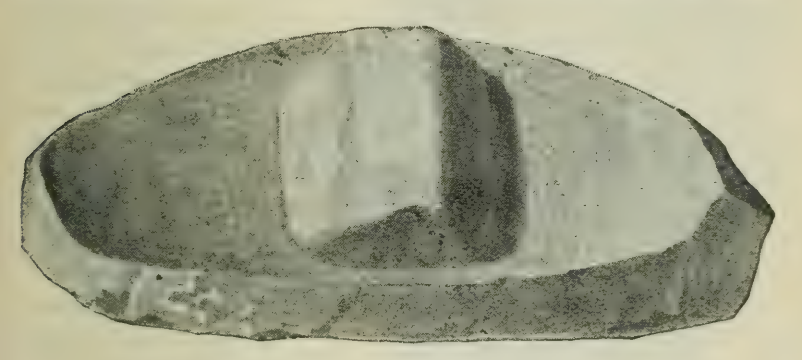


Fig. 16.—Earliest Grinding Stone for Corn.

bear, together with a few other less important mammals, entirely disappeared. The lion, the leopard, and the hyæna migrated to warmer countries, the reindeer and other representatives of Diluvial fauna wandered northwards, whilst the chamois, the marmot, and the ibex sought the regions of the high mountains, to make room for the tame domestic animals which now took their place next to man, whose mode of living also assumed a more permanent character. He made agricultural implements and began in a perfunctory manner to till the ground. He soon learnt to grind corn with millstones, to make meal or bread, to twist cords or threads from appropriate textile plants and make clothing, to shape vessels out of clay, without any knowledge of the potter's wheel, and to

ornament and bake them. He was now able to treat stone not only by hammering and striking but also by whetting and grinding.

In a word, he produced the polished stone implements which gave their name to the whole period, although the previous art of striking the stone with the hammer was still retained and, indeed, was bound to continue as a preparatory process prior to smoothing the stone.



FIG. 17.—Clay Vessel from a Neolithic Pile-dwelling of the Attersee.

It is the period of polished stone ware, the later Stone Age or Neolithic period, the word being derived from the Greek νέος "young" and λίθος "stone."

What was the reason of all this progress? Whence did it originate? Another difficult question! In the caves of Western Europe the Palæolithic and Neolithic strata are frequently separated by vast layers of heavy boulders or rubble-stone or of calc-sinter, so that after the disappearance of the Diluvial inhabitants centuries may have elapsed before a better equipped race arose in their place. In Austrian caves finds have been made which fill up these yawning gaps. Consequently if, on the extinction of Palæolithic culture, Western Europe perhaps became entirely or partially uninhabited for any great length of time, during which a new generation from the East sprang up in their turn, it may be argued that in the East, in Asia or on the boundaries

between Asia and Europe, the civilisation of the Reindeer period gradually developed into that of Neolithic culture, a revival of the Stone Age being scarcely intelligible without the assumption of a new population.

There is, however, no reason to immediately suggest any vast movement of people in the nature of a catastrophe.

Slowly, step by step, the immigration of a few tribes, endowed with a higher degree of culture, took place, and their assimilation with the remnants of the primeval populations of our Continent was only a matter of time.

Kindly nature soon led man to the river, where she had prepared implements almost ready for his use in the shape of axe-like fragments of boulders with which he easily learnt to smooth and whet stone by rubbing it on a rough surface. This art was, therefore, the result of independent discovery in different parts of the world, and the various forms produced in numerous countries of the Old and New World show a resemblance which extends even to the character of the shaft or handle. Possibly a few imported stone axes may have served to divert into new channels the industry carried on in individual dwellings. The production of polished stone implements requires not only skill in hammer-

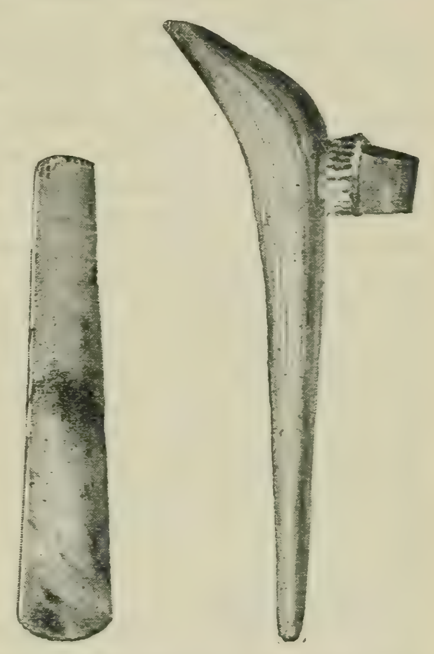


Fig. 18.—Flint Blade.

Fig. 19.—Stone Axe, nephrite blade in staghorn and fixed in a wooden handle like a club.

ing and pressing, but also great patience and perseverance. In order to produce the desired form and to polish an axe-blade on a firm base by means of rubbing, it requires many hours' work and, in the case of particularly hard and tough descriptions of stone, such as nephrite or jadeite, it means weeks, indeed months of labour.

In the same manner, and at about the same period, they began to breed domestic animals in Europe. A very few yoke of breeding cattle may have sufficed to introduce the breed gradually over an extensive area. The ox and the goat, the lamb and the dog and, later on, the hog constitute the oldest stock of domestic animals in the lake-dwellings of Switzerland. The horse was known to the inhabitants of these Neolithic sea-board settlements, but was not yet bred. A glance at other parts of the world immediately shows the advantages enjoyed in ours by the possession of these primeval races of domestic animals. Up to the time of its discovery America had not progressed further than dog-taming. Mexico, in spite of all its high civilisation, could not boast of a single tame animal. In Polynesia the only domestic animals were the hog and the dog. Africa, with the exception of Egypt, only recognised the hog as an animal of the chase, and even within the area of the Nile it does not appear in the order of herded animals until a comparatively late date.

Originally the ox was entirely missing in Australia, Polynesia, and South America. On the other hand, Central Europe, Central Asia, and Africa were the territories on and from which a race of large and strong oxen, the progenitors of our best modern breeds, were bred and distributed.

Amongst the more important European kinds of grains, barley and wheat belong to the Stone Age, while the Bronze Age added rye and oats. All of them probably owe their origin to plants which grew wild on Asiatic plains, and their dissemination to nomadic tribes which carried small quantities of seed with them on their wanderings.

Babylonia, already a fruitful country, obtained its barley first from the North; and Egypt, also blessed with abundance, derived its wheat from the same source. The two latter cereals were then followed, in the later Stone Age of Europe, by millet, which was sown in large quantities. In addition to grown fruit they collected and consumed the produce of the forest, such as apples, pears, cherries, wild plums, whortle-berries, briar, raspberries, blackberries, elderberries, water-nuts, beech-nuts, and acorns.

In the period of the later Stone Age man was still a valiant hunter, whose trophies were found in pile dwellings and land encampments in such quantities as to fill entire museums.

The principal victims of his arrows and spears were the red-deer and the roe, the bear and the wild boar, the fox, the wolf, the beaver, and other animals and birds.

The inhabitants of the Northern sea-board led a peculiar life. They were people whom we only know by their "Kitchen-remains" or "Kjökkenmöddinger," "Kitchen-middens," as they are termed on the eastern coast of Denmark. The scraps and refuse which remained from their meals collected in vast heaps extending over a distance of 100 to 300 metres, a breadth of 50 to 150 metres, and a height of 1 to 3 metres.

They contain ashes, coal, potsherds, implements of flint, bones, and hartshorn; but they consist chiefly of bones (which in many cases have evidently been split by man for the sake of the marrow, or gnawed by dogs) belonging to animals slain in the chase, such as the stag, the doe, the wild boar, the wolf, the fox, the dog, the bear, the lynx, the marten, the hedgehog, the beaver, the seal, and the cat; they also contain the bones of herrings, eels, cod, and glahrke, and finally millions of shells of edible muscle-fish, such as oysters, mussels, cockles, and shore-snails. The shell-mounds of the Baltic also contain the bones of the whistling-swan, the auk, and the turkey, but no traces of agriculture or cattle-breeding, whilst sharpened stone implements, the

real sign of Neolithic culture, are altogether missing. The stone implements found in Danish shell-mounds are, to some extent, different from palæolithic products, and have always been made by simple hammering without being subsequently polished.

The graves of the "Roten Felsen" (Red Cliff) on the sea-shore at Mentone exhibit a similar degree of culture, which the French call *néolithique ancien.* The absence of diluvial forms of animals marks the age as the beginning of the later Stone period. It is natural to assume that the men of the shell-mounds were direct descendants of the diluvial population of Western Europe who retreated northwards as soon as the Baltic coasts became habitable. The assumption is, however, weakened by the fact that they were not really reindeer hunters, but rather fishermen and mussel-dredgers, and that they failed to show a trace, however small, of that artistic talent which surprises us so much in the later period of the Diluvial Age. Similar shell-mounds, which in many cases have been washed off the shore by the inroads of the sea, are also to be found on the coasts of France, Portugal, Ireland, Sardinia, Florida, Japan, Chili, Massachusetts, and Georgia in North America.

If the Danish shell-mounds belong to an early Neolithic period, the numerous finds of dwellings and graves, which present a more imposing picture of the progress of man, will afford us an insight into the nature and characteristics of the fully developed later Stone Age.

We shall revert to the pile-dwellings and their distribution over Europe in a special chapter; meanwhile we are only desirous of emphasising their importance as regards the history of the Neolithic Man.

The Swiss pile-dwellings exhibit three periods of development. In the first we only find small, badly-polished stone hatchets of serpentine, diorite, and saussurite taken without particular selection from the nearest available spot. Coarse, cylindrical clay pottery shows no ornamentation whatsoever. The second period embraces most of the Neolithic lake vil-

lages of Switzerland, with weapons and implements—amongst them large perforated hammer-axes—of a better shape, and frequently of very tough and rare stone, such as nephrite, jade, and chloromelamite. The clay or earthenware pottery is simple, and ornamented with the wolf's tooth, the shaded triangle, and rows of dots.

The third and last period produced a large number of perforated stone-hammers and various well-formed tools of wood and staghorn, earthenware pottery with richer ornamentation, and, in the absence of nephrite and jadeite, the first articles of copper, such as axes, awls, and daggers, which justify us in describing this period of transition from stone to metal as the Copper Age of the Swiss pile-dwellings.

The Neolithic race did not exclusively inhabit the sea-shores, dwelling upon the extensive mounds of their own food-refuse, nor were the cleaner pile-villages erected over the surface of shallow lakes their only habitations, but they also continued to live in caves and built huts on dry land. The habit of living in caves is not easily abandoned in districts where they abound; for instance, in the North-Slavonian countries of Austria (Bohemia, Moravia, and Galicia), in Franconian Switzerland, between Bayreuth and Bamburg in Bavaria, in the districts at the foot of the Ligurian Apennines and to the north of the Adriatic.

Nor is there any very great difference between the modes of living of the Palæolithic Troglodytes and that of the Neolithic cave-dwellers. The ancient classics contain numerous references to them at periods of which we possess historical records; for instance, in Persia, Arabia, Ethiopia, Macedonia, Crete, Sardinia, the north of the Caucasus, and Scythia.

In the Canary Isles, towards the end of the fifteenth century, the Spaniards discovered the Guanches, a people living in caves, and unacquainted with metals. We shall not be surprised, therefore, to find that the caves, which to this day are used by shepherd tribes as temporary places of refuge, afford rich finds of Neolithic antiquities, and even some of the later Bronze and Iron periods.

The Neolithic cave groups present a characteristic inventory of the contents of the settlements of the later Stone Age, and embrace bones of oxen, goats, lambs, hogs, dogs, and frequently bones of the horse, and relics of the chase, such as stag-bones; on the higher points of the sea-shore we find numerous shells of edible mussels, mill-stones, earthenware pottery, tools made of stone, horn, and bone; ornaments for the person, pigment for tattooing, and sometimes clay stamping-blocks, which may have served the same purpose.

In the case of cave-dwellers agriculture seems to have made less progress than among the more civilised inhabitants of lake-villages, and, in accordance with the nature of cave-districts, hunting and cattle-breeding must have been their chief means of subsistence.

In upper Italy, where the Terramare (pile-dwellings on dry land) date exclusively from the Bronze period, certain phases of culture among cave-dwellers are undoubtedly coeval and may belong to some other tribe than the inhabitants of lake-villages, an exception which is, however, by no means convincing.

In the early phases of civilisation Nature held mighty sway on man, and compelled him to submit, without murmur, to the exactions of the soil. Where she provided caves and hunting, there he remained a cave-dweller and a hunter, but where periodical inundations of low-lying plains induced him, not without a little compulsion, to go over to agriculture and live together with his fellow-man in communities, in artificial sheltered dwellings, as a protection against hostile attacks and the force of the elements, there, to his good fortune, he obeyed Nature's dictates, and followed the paths of progress.

In addition to caves and pile-dwellings, we find in the later Stone Age, as well as in the Bronze Age, and extending even into the Iron Age, curious little circular huts erected on dry land, and possessing a moat or ditch as a foundation, which latter is all that remains of them at the present day. These ditch-dwellings are so grouped together, that whole villages can be traced as they still existed among ancient

savage nations in historic ages. On the site of such settlements we now find circular excavations from $1\frac{1}{2}$ to 2 metres in depth, containing coal, hearthstones, potsherds, broken bones of animals, and stone implements, and frequently slabs of clay, which served to plaster the brushwood walls. On the destruction of the hut, generally by fire, the slabs were found to be hard, and burnt to a red colour. In favourable cases, one still finds the holes for the piles which were erected around the hearth as supports for the roof, and other details, such as passages communicating between two or more ditch-dwellings in a circle surrounding the principal hut, which afford us further information as to the establishment of these primitive land-villages.

In laying out these ditch-dwellings there was very little displacement of earth, but the excavated soil was shot down in a circle around the hut to better secure the piles. In the above-mentioned terramare a square embankment was raised embracing the entire area. Other embankments, dating from the Neolithic and later periods, are to be found on isolated hills, promontories, and mountain-summits. Either they extend in a circle around the space occupied by a prehistoric village, and served to protect it, and legally separate the family property from that belonging to the entire tribe, or they run in one straight or crooked line across that portion of the hill which connects it with the neighbouring property.

We frequently find on a hill several concentric embankments of prehistoric times, and at once perceive by the small extent of the area so carefully enclosed that it cannot have been the demarcation of a dwelling-place.

Such sites as the "Hausberg at Geiselberg" in Lower Austria (see Fig. 20) must be regarded as sacrificial mounds, or as the dwelling of the chief of a tribe. On numerous other enclosed and open hills excavations have proved incontestably that Neolithic villages did exist there.

There are no graves of the Palæolithic period in existence; at least none can be identified, and, for this reason—but wrongly so—the primitive Europeans of the Diluvial

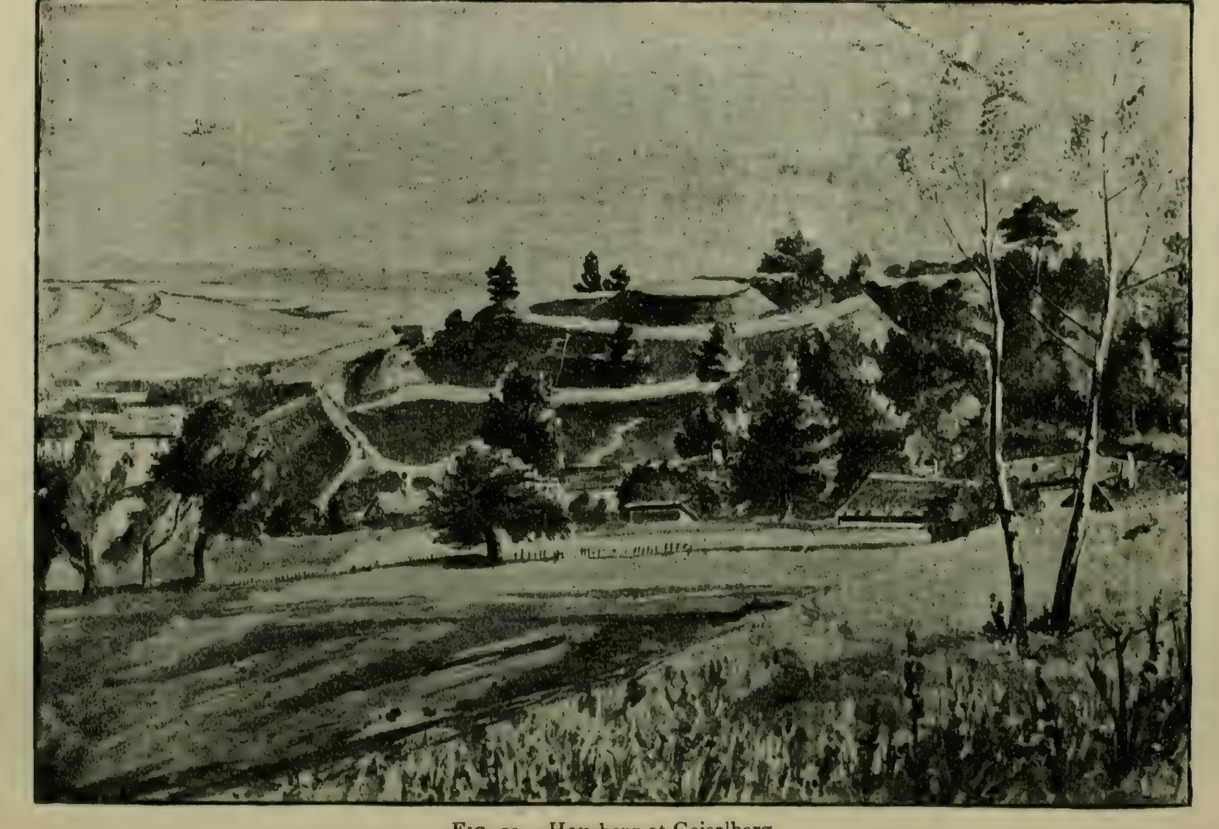


FIG. 20.— Hausberg at Geiselberg.

Age are not credited with piety towards their dead or with a belief in a future state. On the other hand, numerous finds have enlightened us on the burial customs of the later Stone period, but it frequently happens when habitations have been found that we cannot always assign to them the correct burial-places, whilst, in other cases, we find numerous graves, but fail to show the necessary number of dwelling-places. Thus, the subterranean flat graves of the pile-dwellers of Central Europe are, to this day, for the most part, hidden to us, whilst, on the other hand, we know of numerous superimposed graves in Scandinavia, the rich "find" region of the Northern Stone period, but of very few Neolithic dwellings.

During the later Stone Age, the custom of burying bodies uncremated prevailed throughout Europe. Cremation did not come into practice till afterwards, and even then was never and nowhere carried out to the exclusion of burying, which accounts for the number, more or less, of graves containing skeletons which were found in the burial-grounds of the Metal Age in addition to, or next to, graves containing urns with ashes.

The form of burying varied very much. The most ancient form was probably to remove the body into clefts or caves in the rock, such as we find in the early Neolithic period in the grottoes of Mentone and Finalmarina in Liguria, in the cave district of Franconian Switzerland, in England and in France. Artificial grottoes with graves belonging to the latest Stone Age have also been found in the chalk cliffs of the Department of the Marne in France. Wherever there was a lack of natural caves or of soft stone for artificial burying-places, the people of that generation resorted to stone-vaults which they built in the solid cliff. These are the "Megalithic" graves which are missing in Central Europe, but which have been found to extend over a vast area from Syria, over Northern Africa, Spain, France, Great Britain, and North Germany as far as Scandinavia, where they are most numerous. They

consist of immense blocks of stone, little or not at all hewn, set up in the form of a hut with a flat roof. (See Fig. 21, which represents a French Dolmen.[1]) Smaller stones are then used to fill up open spaces. Over the whole there was sometimes an earth-mound, which, in the case of "passage-



FIG. 21.—Dolmen (France).

graves," left the entrance to a radial corridor of similar slabs of stone, uncovered.

This form of grave belongs to the latest phase of the Northern Stone Age, and may be found chiefly in the whole of the Eastern portion of Sweden, whilst the real "Dolmen," without entrance-corridors, was restricted to the Southern and Western coasts of that country, and is of somewhat earlier age.

[1] *Translator's Note.*—Sir John Lubbock (Lord Avebury) gives the derivation of "Dolmen" as follows: "Daul," a table, and "maen," a stone, and advises the retention of the word "Dolmen."

In the West of Germany as far as the Oder (especially in Hanover) and in Holland the so-called "Hun-beds" or "Giant-graves" extend almost to the end of the later Stone period; in Western Europe they are found still later, and in Northern Africa they are even found as late as the Metal Age. They each consist, as a rule, of two rows of large blocks of stone frequently exceeding twenty paces in length. In the northern portions of our Continent, the Age of Megalithic Sepulchral Monuments shows an undoubted advance as compared with the earlier Neolithic period of the Baltic shell-mounds, which, according to an approximate estimate of its time in Denmark, is said to have been about 3000 to 1500 B.C., and is followed by the Megalithic period from 1500 to 1000 B.C. Such definite statements, however, are very open to doubt, and should be received with the utmost caution. According to other calculations the later Stone period is said to have terminated also in Northern Europe about 1500 B.C.

Whilst Sepulchral Monuments of the Megalithic Age were being erected in the regions skirting our own Continent, the inhabitants of Central Europe, the Rhine Provinces, South Germany, Bohemia, and Hungary, in addition to cave-burials were only acquainted with a simple interment of bodies in graves in which the deceased was generally placed, his limbs drawn up, and in a recumbent or sitting posture.

Owing to these burial customs and to a few skulls of pile-dwellers thrown up by the sea, the later Stone Age yielded a much larger supply of craniological material than the Palæolithic period, which is a further proof that already at that time Europe was inhabited by several races of men, amongst which we believe we can recognise with certainty the Dolichocephalic Aryan Race. The Stone Age proper of the Swiss pile-dwellings shows Brachycephalic skulls only; on the other hand, in the Transition Age to Metal and Bronze we only find distinctly Dolichocephalic skulls with wide facial angle.

D

The skulls from the pile-graves of the Northern Stone Age are chiefly Dolichocephalic, and bear an almost certain Aryan character. In France, both the Cave-skulls and Dolmen skulls show very diverse forms, whilst many a cemetery of the latest Neolithic Age in the Rhine Provinces has furnished us with skulls exhibiting conspicuous similarity to the typical form of head amongst Germanic tribes.[1]

Now what is the meaning of the appearance of Aryan men amongst the primitive population of Europe? How is the archæological colouring of our portion of the world affected by this circumstance? The following chapter will answer these questions, and deal with some fundamental features of Aryan character and Aryan history.

6. *Aryans and Semites.*

All civilised nations of Europe derive their origin from one primeval tribe, whose home their ancestors left at an early period, thenceforth to go their own separate way. On the occasion of their first appearance in history they already differ so much that it is only by the aid of Comparative Philology that we are able to trace their primitive uniform origin. This science also teaches us what degree of civilisation the primeval tribe possessed, and what culture was acquired by the offshoots of the primitive stock[2] in the course of their wanderings or in their subsequent settlements.

We do not know the locality of the primeval settlement of the Aryans before they branched off, nor what space of time elapsed until the separated tribes settled down in their subsequent dwellings. In the course of these wanderings the peaceful shepherd became the warrior to whose deeds of prowess we must ascribe the second great epoch in the

[1] In a forthcoming Primer of Göschen's Collection, special articles will be found on "Brachycephalic," "Dolichocephalic," and "Facial Angle."

[2] See further on this subject in the Primer No. 59 of Göschen's Collection, entitled "Indo-Germanic Philology," Supplement.

history of the European world. It is in the obscurity of ages that we must seek the foundation of the deeply-rooted distinctions between the European Aryan and the Asiatic Aryan, the Hindu.

Perhaps it was from the vanquished stranger-foe that our ancestors learnt the art of agriculture. In their later habitations we meet them as Greeks, Italians, Kelts, Germans, Illyrians, Slavs, and Letts.

The primeval Aryans had no knowledge of the sea. They lived inland, surrounded by mountains, and were a pastoral tribe with settled habitations, unacquainted with agriculture, metals, or life in towns, indeed, without any culture of higher degree.

According to the teachings of Comparative Philology the primitive Indo-Germanic race possessed herds of cattle, flocks of sheep, pigs, and goats, which were guarded by dogs. The open river-valleys served as pasture-fields. In the dense forests skirting their settlements they collected wild fruits and hunted the deer, the boar, and the wild bull, whose flesh they consumed and in whose skins they clothed themselves.

Weapons and implements were made of stone, bone, and antlers. Leather was sewn with bone needles and bullock-sinews. Leather straps were used to tether and bridle draught cattle, and willow wicker-work covered with leather served as a shield. The hunter's bow was made of yew, the spear-shaft of ash.

The giant trees of the "forest primeval" were felled by means of fire and blows of the stone-axe and then hollowed out to form canoes for use on rivers and lakes ("single-tree" boats).

At a very early date we find the wheeled cart carrying the entire possessions of the family on their wanderings, in use with and common to all Aryan tribes. They made coverlets, cloths, and caps out of lambs' wool, and ropes, matting, material for clothing, hunting, and fishing-nets out of tree-bass.

The chief possessions of these primitive tribes consisted of their stock of cattle, which were always exposed to the dangers of the forest, the wild beasts, and to the influences of wind and weather. The idea of covered cattle-pens or barns had not yet occurred to them, and the absence of these necessities accounts for the bad condition and consequent low value of the earliest domestic animals. Cattle also served as a means of payment, and took the place of money; wooden piles, brushwood, and straw were the materials with which they built their huts. The culture of the vine was unknown.

In warfare our Indo-Germanic ancestors were savage and bloodthirsty. Even the Cimbri and Germanic tribes referred to by Tacitus slaughtered or mutilated their prisoners to render their escape more difficult when it was desired to retain them as slaves. Old men and incurables laid down their lives voluntarily. Religion required human and animal sacrifices as an atonement for sins or on the death of a chief. Men secured wives by raids and forcible abduction, and on the birth of a child the father decided whether it should be allowed to live or exposed to die.

These most primitive forms of government clearly indicate that they owe their origin to the simple association of families. Artificial scars (tattooing) distinguished the members of the "aristocracy." The forces of Nature were the subjects of divine adoration. Much importance was attached to prognostic signs, the power of formulæ, of incantation, and other growths of superstition.

The Aryan languages are typical of a tree with a profusion of branches, of rich growth and beautiful form, which develop and spread luxuriantly for a time, but shrink up and become stunted when they stand in the way of the requirements of more rapid communication.

Whilst the Aryans remained in this low state of culture, other nations in more favourably situated regions had made vast progress. In the valley between the Euphrates and Tigris a Turanian tribe had first established its dominion,

and subsequently lost it to Semitic conquerors. This tribe bore the name of Accadians in the north and Sumerians in the south. Surrounded by the halo of the dawn of history they appear to us as teachers of the Babylonians and pioneers in the van of Asiatic-European civilisation. From their knowledge and inventions the Semitic race derived their principal power. Assyrians, Phœnicians, and Israelites are indebted for their early development to the Babylonians, who assimilated with the Sumerian-Accadian stock.

The Sumerians, and similarly the Babylonians, were, in the first instance, great agriculturists. They drained Mesopotamia, which was a land of marshes, by means of canals, and drew the plough where there was formerly nothing but virgin woodland. They possessed themselves of the metals treasured up in the depths of the earth, and produced therefrom implements, weapons, and current coin.

Down the mighty rivers and ingeniously constructed canals, into the Persian Gulf and to the countries along its shores, on rafts and in ships, the products of industry and commerce were carried directly from their place of origin to the very stalls in the markets at home and abroad. Towns, temples, and palaces were built of baked brick and walls drawn around them. These edifices contained valuable inscriptions, for writing had been invented and was employed to fix and retain the historical records of incidents and important scientific discoveries. A permanent system of weights and measures was introduced, and astronomy served the nautical requirements on the high seas.

The natural foundation of the surprisingly early and high development of Semitic nations is to be sought in the nature of the soil of Mesopotamia, the land between the two rivers. The Aryans were shepherds, the Semites husbandmen, from time immemorial. The former inhabited a mountainous country which could not inspire the invention of the plough, because the formation of the ground did not lend itself to the use of such an implement, but favoured in its stead the breeding of cattle and the cultivation of pasture and grazing

lands. On the other hand the Semites possessed in Babylonia an unusually fruitful and level country naturally adapted to agriculture, which encouraged man to devote himself faithfully to it, even under more difficult circumstances. However, notwithstanding such favourable conditions of the soil, the husbandman is called upon to exert himself more than the cattle-breeder in order to gain a livelihood. The true blessing of agriculture consists in man's being compelled to work, just as the shepherd is cursed by his opportunities for idleness. Indolently the latter watches his herds seeking their own food, whilst the husbandman "eats his bread in the sweat of his brow." Profit by hard work entails economy in its expenditure; easy gain leads to extravagance. The former was the distinguishing feature of the Semitic character, the latter has often been held up as the blemish in the character of the Aryans.

But the intelligence required by the husbandman is different to that of the shepherd, whose daily work is a simple matter of routine, whilst that of the former is manifold and complicated. His first idea was to make a series of important inventions which, though thoughtlessly passed over by his successor, the modern agriculturist, were once the objects of admiration as the highest production of human intelligence. The earlier occupation is that of the shepherd, the later that of the husbandman. If biblical tradition reverses the position, attributing agriculture to Cain, the elder son of Adam, and a shepherd's life to Abel, the younger, it would appear to prove the greater age of the former occupation amongst the Semites, whose traditions alone connect agriculture with the initial existence of our generation. Cain kills Abel. He is the victorious brother, but also the inventive, unstable one, the founder of the first town, as it is stated in the Bible. Amongst Semites and Chamites the town, as such, is the first sign of progress, and tradition is also right in attributing to the husbandman the founding of towns. This seems very strange to us at the present day, since we have been taught to regard town and country as

direct opposites, just as we fail to find the ancient, untiring husbandman in the modern Semite. Originally however, the town was not called into existence as a domicile for traders, nor as a market for the merchant, but was intended as a fortified place for the mass of the agricultural population. In the beginning, and long after, the town-walls and towers were the principal objects, and not the dwelling-houses, streets, or squares. The most ancient towns were half-empty sites on hilltops, if possible, near rivers and steep walls of rock, difficult of access and protected by earth and stone works and palisades, behind which the whole population retreated on the approach of the enemy, bringing their cattle along and hiding any property they carried with them. As a consequence they also met there at other times when occasion required. It was not until later that the lower town, also surrounded by a wall, was built at the foot of the hill-fortress which now became the upper town.

Subsequently, in addition to times of war and periodical festivals, the town became a natural centre for those who were not agriculturists, but lived by trade or commerce. If the defences of the town originally enclosed more space than the inhabitants required, the latter gradually filled out the whole area, and in consequence of the increasing population the fortified hilltop could not be used in times of war for their original purpose.

That towns were founded by agriculturists is demonstrated by the ceremonies on such occasions which the Etruscans took over from the Romans. According to their custom the line of the proposed walls had first to be drawn by the plough, the share being lifted off the ground wherever a gate was to be placed. Had merchants been the founders of towns, instead of husbandmen, they would not have employed the plough in marking the area, nor would they have drawn the line for the walls, but they would have set the boundaries of the market-place, around which the town would then have developed of its own accord. Nowadays the walls of defence of most towns have fallen and disappeared, and

what was once of secondary consideration only, namely, dwelling-houses, public buildings, streets and squares, has now become the principal object.

As agriculturists and inhabitants of the plains, the Babylonians were bound to proceed to the building of towns before the dwellers in the mountains. The open land offered them no protection from hostile attacks, whilst hilly districts formed natural bulwarks. Thus the Aryans who lived in the mountains were able to exist for thousands of years without towns, whilst the Hamites in the lands of the Nile, the Semites in Mesopotamia, were compelled to create artificial shelters in order to preserve their characteristics and independence. Another advantage of a town is that it binds man to the locality, and induces him to introduce the developing principle of civilisation, division of labour.

The Greeks, Italians, and Kelts became acquainted with these and other advantages of the life in towns from their intercourse with Oriental nations. Perhaps the Etruscans themselves, the earliest town-building people of Italy, were not of Aryan Oriental origin. Possibly the Teutons and Slavs only appear so late in history because intercourse with the East was denied them.

In the same sense that town is opposed to country, so does stone stand in relation to wood. Although stone is to be found in abundance in the mountain ranges, the husbandman who wishes to build takes wood in preference, because it is easier to fell trees than to break stone.

Mesopotamia possesses neither forests nor stone quarries, but the Akkadian-Sumerians already formed bricks from clay and baked them, with bitumen as mortar. Thus the absence of both wood and stone inspired man to an invention of which he may justly be proud. According to Holy Writ, the Tower of Babel, that monument of human temerity, was made of bricks, which were either burnt in the heat of the sun or baked in an oven.

The clay tablets, a convenient and cheap writing material, which have survived the mark of time and afford us informa-

tion of a past of which we scarcely dreamt, were also baked in ovens. They were able to impart a coloured glaze to their bricks in burning them, and their walls were thus painted with variegated tints. But as fuel was expensive in a land so poor in timber, burnt bricks were only used for public edifices, and private dwellings were made with bricks dried in the open air. This was the origin of the celebrated Babylonian architecture, which boasts of a greater age even than the Egyptian.

The first in Europe to follow the example of the Semites and Egyptians were the Greeks, judging from the puzzling prelude of Mycenian culture,[1] which tells of splendid specimens of stone architecture (see further, and at end of Chapter 8). But they also have traditions of an age in which they only knew of wooden buildings. Traces thereof are more frequent among the Italians (Latins), and although, at the beginning of our time, the Kelts lived in towns, the houses consisted of circular huts, constructed of planks and brushwood, and roofed over with straw.

The walls of their towns were timber scaffolding, filled out with stones and clay. The Germanic race, at that period, had wooden huts which they could take to pieces, load up on waggons like tents, and carry along with them. The most dangerous enemy of wood huts is fire, and if the incentive to isolate their dwelling-places distinguishes the Germanic people from all other nations, the simplest explanation is the fact that they did not possess any towns and feared the fire.

Amongst Slav nations, especially in Russia, wood architecture has survived to this day. Only churches and monasteries, as edifices of greater and exceptional importance, were from time immemorial built of stone, and during the incursion of the Mongolians these buildings alone afforded the oppressed people refuge and protection.

Navigation was another mighty foundation-stone and

[1] *Vide* No. 49 of Göschen's Collection, "Grecian History," § 2; and No. 16 of the same Collection, "Grecian Archæology," § 69.

mainstay of Oriental, and especially Babylonian, and then Phœnician culture. Nature had provided the Mesopotamians with wide, navigable streams, and a far-stretching inland sea, teaching them in turn river, coast, and open sea navigation. The latter required a knowledge of the stars, which they, in fact, possessed, and thus developed the science of astronomy. By visiting distant coasts they became merchants on a large scale, and consequently had to thoroughly master the art of calculation, adjust their weights and measures, and regulate their legal institutions.

Treasures from all quarters of the globe flowed in upon the Mesopotamians, raising them above all other nations, but eventually proving their downfall, as the Persians were thereby tempted to rise and conquer the country.

Before the destruction of Babylon, what was of permanent value within its walls was saved to future generations. Already four thousand years before the Christian Era there must have been intercourse between Babylon and Egypt, otherwise the latter would not have been able to learn from the former how to build with baked bricks. But the last and true heirs of the Babylonian culture were the Aryans, who received their heritage through the medium of commerce. The Babylonians participated but little therein; the Phœnicians, a sister nation, appeared as intermediaries. They possessed no rivers, nor narrow lakes, but a broad sea-board very favourable to commercial relations abroad. They had trade settlements, trade consuls, and trade concessions.

The Carthaginians transplanted Babylonian-Phœnician civilisation to the coast of Africa, and to many points on European shores. Carthage soon outstripped Tyre and Sidon, where a republican constitution flourished which had not found a home in Asia.

The Babylonians created Semitic culture. Phœnicians took it over and brought it to the Aryans across the sea, for the Asiatic Aryans (the Indians and the Persians) received their culture direct from Babylon.

Thus Greece first awoke from her primitive slumber, then Italy, and at last the Kelts, whose culture was eclipsed by that of the Greeks and Italians, but was of a much higher degree than is ordinarily supposed. The most backward were the Germanic races and the Slavs. The Aryans, in receiving Oriental culture, brought with them, in the first instance, their high plasticity. The Oriental always directs his mind to that which is practical. He had certain fixed limits which the Aryan, by his higher powers of reception, has overstepped. He was the pupil of the Semite, whom he subsequently outstripped. The same was done by the Greeks in arts and science, by the Romans in law and war, and by modern nations in all those arts which make up the pride and boast of modern culture.

The Semites of old accomplished a great task when they carried out the mission which had been entrusted to them, but there were still greater things to do.

From this point of view, in the history of the world, it is of surpassing interest to become acquainted with the Aryans at the time of their first appearance in Europe according to records on monuments, and to examine the degree of culture they possessed prior to their earliest connection with the Semitic civilisation of Western Asia. Looking around amongst the prehistoric antiquities of Europe, we find that the primitive culture of the Aryans, as ascertained by Comparative Philology, is archæologically represented almost identically in the pile-dwellings of the later Stone Age.

These settlements show at the same time by the manner of their foundation a characteristic and well-appreciated degree of progress in the civilisation of mankind, which we, however, cannot at so early an age trace back to Oriental influence. Judging from our general consideration of the Neolithic period we might be justified in attributing the numerous antiquities of the later Stone Age from North German countries (Scandinavia) to the Aryan, and more especially, Germanic inhabitants. But from this district we know of nothing similar to the lake-villages of the region

of the Alps and Upper Italy, or to the villages of huts on dry land in Central and Southern Europe. We thus light upon the historically proved distinction between the Southern and the Northern Aryans of Europe. The former (the Greeks, Italians, Kelts, and Illyrians) arrived at great power before they came into historical contact with the Semitic Oriental, possibly in consequence of their hostile collisions with a primeval stock of lower type, and they produced by the force of their own power and will forms of culture which facilitated their gradual transition to higher conditions, whilst the latter (the Germans and Slavs), weakened by internal strife, remained behind in a backward condition for many centuries on formerly uninhabited tracts of land until a path was opened to them also which led to their appearance as a military, and, consequently, as a political power.

7. *Pile-Dwellings.*

The pile-dwellings of prehistoric times exist to-day as larger or smaller groups of wooden piles rammed into the bottom of lakes close to the shore. Ages ago the projecting parts must have broken off down to the level of the water, and in the course of thousands of years the dashing of waves and the surging of drift-ice must have still further destroyed them, so that the fact of their existence can only be ascertained by thorough investigation. But there was a time when they topped the highest crests of the storm-tossed billows and carried on their cross-beams a staging of planks on which stood the wood and straw huts of the inhabitants (see Frontispiece). It was then that thick layers formed at the bottom of the lakes, and to these layers primitive archæology is indebted for all its various proofs and evidences. Broken saucepans and scraps of food were thrown into the water together with coal and ashes. Now and then, some still useful articles would slip out of careless hands, or in the course of attacks, fights, or conflagrations, many an object

must have fallen into the water. In all probability most of the pile-dwellings were destroyed by fire.

Incredibly large is the number of articles which have come into our possession in this manner, found lying in undisturbed rest, and therefore doubly valuable. The pile-dwellings in Europe centre around the zone of the Alps which divides the middle Southern peninsula of this hemisphere from the principal body.

They are located in Switzerland, where they were first discovered in 1853–54, in France, Italy, Germany, and Austria. Some lakes and turf-moors—old, dried-up lakes—frequently contain whole rows of such settlements. We append a list (according to Mortillet) of the pile-dwellings hitherto discovered in the foregoing countries:—

(1) SWITZERLAND (160 Settlements).

The following lakes:—

Zurichersee	7
Greifensee	5
Pfaeffikersee	3
Untersee	6
Nussbaumersee	1
Zugersee	6
Bildeggersee	1
Sempachersee	9
Wauwylersee	1
Mauensee	1
Inkwylersee	1
Moosseedorfersee	1
Bielersee	20
Neuenburgersee	51
Moratsee	18
Luiselsee	1
Genfersee	27

(2) FRANCE (32 Settlements).

Lake of Geneva	17
Lac d'Annecy, Savoy	6
Lac du Bourget	8
Lac de Clairvaux,—Jura	1

(3) ITALY (36 Settlements).

Turf-moor of Mercurago, near Arona, south of the Lago Maggiore	1
Lago Monate, near Varese	3
Lago di Varano	1
Lago di Varese	1
Turf-moor of Lagozza	1
Lago di Pusiano	1
Lago d'Annore	4
Turf-moor of Polada, near Desenzano	1
Lake of Garda, west of Desenzano and east of Peschiera	9
Turf-moor of Saline, Prov. of Verona	1
Turf-moor of Cascina, Prov. of Verona	1
Turf-moor of Loffa di Sotto, Prov. of Verona	1
Lago di Fimon, near Vicenza	1
Lago d'Arquà, in the Colli Euganei	1

AUSTRIA (11 Settlements).

Moor of Laibach	1
Keutschachsee, Carinthia	1
Attersee	6
Traunsee	1
Mondsee	2

(The three last in the Salzkammergut.)

GERMANY (46 Settlements).

Tegernsee, near Munich	1
Roseninsel, in the Starnberg Lake	2
Federsee, near Buchau, Wurtemberg	1
Bodensee	11
Ueberlingersee	13
Untersee	18

In the zone of the Alps we thus know of 284 lake-villages, the majority of which (160) are in Switzerland; then follow Germany, Italy, France, and Austria. The largest number of finds are in the Neuenburgersee. The Bodensee contains the same number of Settlements (51) if we reckon its extensions; then comes the Lake of Geneva with 44, the Bieler See with 20, the Lac de Morat, the Lago di Verese, the Gardasee, &c. The most westerly are the

lakes of Bourget and Clairvaux; the most northerly the Federsee and the Starnbergersee; the most easterly the Laibacher-moor, and the most southerly the Turf-moor of Lagozza. The region of pile-dwellings lies around the chain of the Alps in the foot-hills or on their plains, but does not penetrate it. In the interior of the chain there are a number of small lakes, such as the Vierwaldstaedtersee, the Hallstaettersee, in which, however, no pile-dwellings have been met with. But also in the immediate vicinity of densely populated lakes in Carinthia, Carniola, Upper Austria, Bavaria, and Switzerland we find many apparently eminently suitable basins in which no pile-dwellings have been hitherto discovered; whether it is that the remains are obstinately hidden from our view, or whether, for some unknown reason, these lakes were purposely avoided by prehistoric pile-dwellers, it is impossible to say. The size of the pile-dwellings varies very much. At Staeffis, in the Neuenburgersee, there are two lake-settlements of the Bronze period, near together. One of them only measures a few square metres, whilst the other is over 200 metres long and almost 50 metres wide.

The Stone Age pile-dwelling at Concise, on the other shore of the lake of the same name, was almost as large. The so-called "Great Settlement" of Morges, in the Lake of Geneva (Bronze Age) is 360 metres long and 30 to 45 metres wide, or of an area of more than 10,000 square metres. It is quite possible in such lake-settlements to distinguish single farms, villages, and town-like places, the latter having undoubtedly a large population for whose requirements ample provision was made by an extensive system of division of labour.

In point of time, pile-dwellings may be divided into those belonging to the Pre-metallic period and those of the Metallic period of primitive archæology. In the former, weapons and implements consist only of stone, bone, horn, or similar substances, but never of metal. In the latter, in addition to implements of stone, we also find some of copper, and especially of bronze. Towards the end of the Bronze period

iron appears here and there, not to the extent of importance which it subsequently attained, but as a rare metal for ornamental purposes.

As pile-dwellings of the Stone period may be regarded, *e.g.* Settlements of Robenhausen in the Pfaeffikersee, near Zurich; Wangen, on the Bavarian shore of the Untersee, near Konstanz; Locras, in the Bieler-See; Concise, in the Neuenburger See; Clairvaux, near St. Claude, in the French Jura; then the Settlement on the Garda-See, where it empties itself into the Mincio.

As examples of pile-dwellings of the Bronze period we may mention the Settlements of Steinberg-Nidau, to the north of the Bieler-See; Auvernier, on the west shore of the Neuenburger-See; Grésine, in the Lac du Bourget; Savoy and Peschiera in the Garda-See.

Of these forty-four pile-dwellings of the Lake of Geneva the age of six—according to Mortillet—cannot be fixed, whilst fourteen belong to the Stone period and twenty-four to the Bronze period. All the pile-dwellings in Austria are of the Stone Age. In general, the lake villages of the north belong for the most part to the Stone Age, those in the south to the Bronze Age. The pile-dwellings of Europe supply an incontestable proof of the existence of a Stone Age proper, and of a subsequent Bronze period in which iron was unknown.

This becomes perfectly clear if we pay a little more attention to the situation of certain individual groups of pile constructions. Between the "Great Settlement" of Auvernier, belonging to the Bronze period and the shore of the Neuenburger See, there are two small settlements of the Stone Age which lie so near together that there is only a space of thirty metres between the two earlier finds and the later one. Near Morges, in the Lake of Geneva, there is a pile-construction of the Stone Age close to the shore, and at a distance of two hundred metres from the latter we have the "Grande Station" of the Bronze period. Similar observations were made in other lakes. The pile-dwellings of the Stone Age were built

so close to the shores that their remains may frequently be found entirely or in part on dry land. The Settlements of the Bronze period were situated farther out in the lakes. Consequently the little foot-bridges which connected them with the shore varied in length; those of the Stone Age were from 10 to 20 metres long, and 1·20 to 3 metres wide, whilst that of the pile-dwelling of the Bronze Age at Nidau was 198 metres long and 6 metres wide; that of Moerigen, of the same period, was 270 metres long and 4·80 metres wide. We obtain the clearest insight into the condition of affairs at that period when towards the end of the Stone Age implements of metal were used for the first time to a small extent. The pile-dwelling of Meilen, in the Lake of Zurich, belonged otherwise entirely to the Stone Age, but contained two small bronzes—a flat axe and a simple bracelet. In the Settlement at Concise they found, next to innumerable stone objects, one single article of bronze, namely, a curved knife, ornamented with etchings.

There are a good many instances in which copper articles occur singly at an even earlier date, as in the Mond See, Upper Austria, but in such surroundings that we must, nevertheless, attribute the pile-dwelling to the Stone Age.

Other lake villages may be at once designated as transition Settlements from the Stone Age to the Bronze Age. Thus, at Morges, in the Lake of Geneva, in addition to the two Settlements of the Stone Age, and a third of the later Bronze Age, there is a fourth, which in point of time falls between the two; for it contained, besides awls, knives, arrow-heads, and other stone objects, also eighteen bronze hatchets of ancient form with simple edges. The "Great Settlement" of the Bronze Age is not only much richer in metal (there are 450 bronzes, viz. needles, bracelets, chisels, knives, swords, daggers, and spear-points), but it possesses also more advanced forms of axes; for instance, a hollow axe and sixty so-called palstaves, or flat axes, the edges of which have developed into four broad shaft-lappets. The transition Settlements are also of importance, because they teach us how

to separate the earlier types of the Bronze Age from the numerous types which are frequently handed down to us without proof of their origin, and so enable us to follow the development of culture in the Bronze Age in Central Europe, at least through the medium of two great periods, an earlier and a later one.

The pile-dwelling in Gévosin in the Bieler Lake yielded, in addition to a large number of hewn and polished stone articles, a flat axe with edges, a treble-edged blade of a dagger, with rivet holes in the lower part, a double needle, and a small, massive bracelet of bronze. Such finds repeat themselves in other lakes, and the strict separation of the localities enables us to regard the discovery of bronzes of this description next to numerous stone articles as a fixed point for the determination of their chronological order.

As copper announces the coming Bronze Age and the period when pile-dwellings flourished, so the very rare appearance of iron indicated the end of those dwellings which were vouchsafed the longest existence.

Near Moerigen in the Bieler Lake they found bronze bracelets (inlaid with iron) and sword-handles. The new metal was probably regarded as very precious, as it would not otherwise have been employed in the ornamentation of articles of bronze. In other not too distant countries, such as South Austria, Upper Italy, and France, they used iron at that time to a much greater extent.

For some reason or other it did not penetrate into the region of the pile-dwellings till afterwards, and then the greater part of the lake-villages were already abandoned, burnt, or sunk. The inhabitants had retreated to the dry land and begun a new life.

The "terramare"[1] of Upper Italy (pile-dwellings on dry

[1] *Translator's Note.*—In the revised translation by E. B. T. of Louis Figuier's "Primitive Man," London, 1870, p. 232, the following explanation of terramare is given: "The term 'terramara' is applied by MM. Strobel and Pigorini to the accumulation of ashes, charcoal, animal bones, and remains of all kinds which have been thrown away by man all round his dwellings, and have accumulated there during the

land) are a peculiar feature in the pile-habitations of ancient Europe. They are situated in Western Emilia, in Parma, Reggio, and Modena, and consist, for the most part, of little hillocks of more or less rectangular form, flat, about 2 to 5 metres high, by 97·200 metres long, by 74·150 metres wide.

At a later date they frequently erected churches, monasteries, vicarages, and even castles, on these artificial earth-mounds. Large quantities of ashes and coal, bones of animals, potsherds, and other relics of human culture were subsequently found in these terramare, and for this reason they were said to be the cremation-grounds of savages. But as soon as portions of huts, primitive mill-stones, castings, and many articles of daily use, were discovered in the interior of these mounds, there was no longer any room for doubt that the latter were the remains of living-rooms and workshops of human beings.

We now possess information respecting no less than 80 terramare; 68 are on the right bank of the Po, and extend from the foot-hills of the Apennines to the basin of the river, in the provinces of Ravenna (1), Bologna (6), Modena (17), Reggio (20), Parma (20), and Piacenza (4). On the left bank of the Po there are no more than about 12: in the provinces of Cremona (2), Brescia (1), and Mantua (10). Of the terramare of the province of Modena 9 are on hills (one of them 150 metres above the level of the sea), 5 in the plateau between the promontories of the Apennines and the ancient Roman Via Æmilia, and 2 are in the valley below the Roman Road. One of the last-named is only 30 metres above the level of the sea; in the province of Parma there are still lower lying terramare. In general they are to be found more frequently on the plains than on hills. In early days they were fortified encampments. An earth-

lapse of centuries. The name which has been given to them was derived from the fact that they furnish a kind of earthy ammoniacal manure, known in the district by the name of terramara." Another term is "Palustrine Settlements," or "Marnieras."

work mound was drawn in straight lines at right angles to the habitation. Beyond the mound there was a moat filled with water, and in some instances we can recognise both the canal which fed it, as well as the spot where the water emptied itself, and the bridge over the moat. Within the mound there was a wooden railing, and in the basin thus created there were the huts, which were built, like the lake-villages, on a pile-staging. This staging or scaffolding was constructed as a protection against the dampness of the soil, and to enable the inhabitants to survey the whole plain. The platform was covered with clay, and the huts built of brush-wood and lined with clay, and rested on a scaffolding of wooden piles. Formerly it was thought that these basins were filled with water throughout the year, but it appears that only fortuitous inundations took place periodically, in consequence of the excessive rains or snows. We rather incline to believe that only a portion of the interior was furnished with piles, and large areas were left free from wooden structures as a refuge for cattle.

The inhabitants of the terramare were cattle-breeders. This is proved by the numerous bones of oxen, goats, and pigs which, to judge by the remains, were slaughtered and consumed. They also hunted and tilled the ground, and carried on a few primitive industries.

They carved in wood, staghorn, and bone; they polished stone, and knew how to cast bronze, although they could not refine it. The terramare of Montale, which by no means belong to the richest in bronze, yielded, in a cubical space of 950 metres, 5 stone implements (1 dagger and 4 saws), 53 articles of bronze, 268 articles of bone and staghorn, and 1000 clay spinning-wheels. In other terramare stone articles are more frequent than bronze, whilst some contain, almost exclusively, stone or bone implements.

The inhabitants of the terramare were in the habit of burning their dead, and interring the ashes in plain urns outside their settlement. They were extremely saving in the matter of accompanying presents, and their vessels of clay

are very seldom ornamented, and when they are decorated, it is in a very simple manner. The terramare villages belong to the early Bronze period, about 1500–1000 B.C. The types found in them consequently serve as indications, when it is desired, to distinguish the finds of the initial and early Bronze period from the discoveries made in the Swiss pile-dwellings, some of which have lasted much longer than others.

The pile-dwellings of Italy are restricted to the northern portion of that country, and are not met with on the other side of the Apennines. Consequently, in point of site, they belong to the great central European region of pile-dwellings. They form two groups: one to the west of Piedmont and Lombardy, for instance, Lagozza, Varese, and one to the east of Venice and Emilia. The former is certainly poor in metals, and belongs to some extent purely to the Stone Age, lacking certain forms of implements or utensils which are characteristic of the other group, for instance, the "ansa lunata," the ornament on the handles of clay dishes or cups in the form of a half-moon.

The second group is richer in metals. Here we meet both with real lake villages like those of Lake Garda, which, on account of the long duration of their Bronze Age, are associated with the Alpine settlements, and with the terramare described above, which represent, in a certain degree, the closing form of life in pile-dwellings in a rapidly developing region. For whilst the inhabitants of Alpine countries and partly also those of Western Upper Italy, after the appearance of the pile-builders, were vouchsafed a long period of rest and undisturbed development, the progress made in Eastern Upper Italy, and partly also in the Eastern Alpine countries was more rapid, and was hastened by exterior influences.

Pile-dwellings were abandoned in Eastern Alpine countries shortly after the first appearance of metals. In Eastern Upper Italy they lasted a little longer, but not so long as in Switzerland, and exhibit, as we have seen, very marked

differences in the manner in which they are built. Whilst not venturing to make any definite statement, the archæologist of prehistoric times may suggest as a reason for the foregoing, that the extensive but low-lying region of the Eastern Alps and the Eastern portion of Upper Italy were settlements of the wandering nations which moved from their original habitations in western and southern directions.

Italian tribes, the Illyrians, and perhaps the Etruscans, inhabited these portions of the Alps and Upper Italy and established either temporary or permanent settlements, bringing greater activity and change into these regions, whilst in the West the Keltic tribe alone developed mightily, but to the detriment of the non-Aryan Iberians and Ligurians, some of whom still lived in caves in historic times. Thus the nature of their settlements was the cause of the varied fortunes which awaited the Aryan nations. The Italians in Upper Italy, south of the Po, and in Central Italy, wherever the Latin stock had settled between the Tiber and the Albanian Hills, occupied such territories as were more easily accessible to and generally favoured by Oriental merchants on their sea-journeys. The Illyrians participated in the advantages afforded by the Adriatic as a road on the high seas for trading-vessels. The Etruscans, whose origin is a mystery to this day, formed by their position and early political development a powerful connecting-link between the Orient and the Occident, and the influence of the higher civilisation of the East found here a ready soil for the seed it was destined to disseminate.

8. Metals.

The history of Metals in the hand of Man is equivalent to the history of his higher culture. Consequently it begins in many different parts of the world in relatively later ages. The most important metals of culture are iron, copper, tin, and bronze, which is a fusion of the two latter. The so-called precious metals are less important, as is evident in

Mexico and Peru. As gold and silver are found in a pure state in alluvial soil, and are, therefore, immediately visible to the naked eye, they were easily discovered, but only used for decorative purposes and as money, but as soon as coins were made of the precious metal it led to mighty strides in the development of culture.

I. General Survey.—If for the moment we put aside the two most important spheres of culture in the Old World, *i.e.* Western Asia and Europe, which require special consideration in their own historical order, and, with the Mediterranean as a starting-point, allow our glance to take in the whole universe, we see that each nation entertained a different feeling in regard to the metallic treasures of the earth.

(*a*) *Africa.*—The Negro-World of Africa forms a sphere of culture of its own, in which the knowledge of iron followed immediately upon a pure Stone Age. The use of iron appears to have spread from the north-east to the south-west; for in the territory of the Nile and in the neighbouring districts we find the highest development in the production of iron, and it is probably here that we have the earliest traces of the metal. Ancient Egypt had its Stone Age like every other land, equally so, Tunis, Algeria, Morocco, and Upper Guinea. We possess rich finds of the Stone Age in South and Central Africa and in Somaliland to the east of the Black Continent, for instance, some only hammered, some polished implements and weapons, frequently of astonishing similarity to those of Ancient Europe, axes, chisels, scrapers, spear and arrow heads, and knives. Discoveries have been made of extensive workshops for the manufacture of these articles, in which the raw material, flint, basalt, greenstone, &c., were treated.

On this common foundation Africa developed very unequal degrees of culture. In Egypt, as with all more civilised nations of the world, copper, and especially bronze, enjoyed a favourite position, preventing iron for a long time from taking its natural and rightful place. In the frescoes of Egypt all iron articles are coloured blue. Instruments

or weapons painted blue do not, however, appear on the walls of the ancient kingdom. As a matter of fact most of the Ancient Egyptian articles of daily use in our museums are made of bronze. Therefore, if iron was at all known, it could only have been used to a small extent compared with bronze. The treatment of iron in the land of the Nile does not seem to have made any progress towards development until after the middle of the second millennium before the Christian era. It has rightly been suggested that the negroes received the knowledge of iron from Ancient Egypt. Even now the weapons and implements of the negroes exhibit conspicuous similarity to those of the Ancient Egyptians. The same may be said of the bellows, which they used for smelting and working iron. The knowledge of this metal, which was very abundant in the form of fusible mineral ore, spread over the entire continent of Africa, although it may have passed over some tribes. The ore was treated in a very primitive manner. Charcoal-burning was still very undeveloped. We never meet with brick smelting ovens, but frequently with clay ovens, or simple holes in the earth. On the other hand, bellows without valves were known everywhere. The product they obtained, however, was not molten raw iron or cast-iron, as is the case with our modern blast-furnaces, but a soft lump of malleable iron in the subsequent purification of which the smith had all his work cut out for him. This method is termed the direct winning of iron, and was the universal custom in Ancient Europe after the metal became known. Only in a few places wrought-iron is steel-hardened by immersing it red-hot in cold water, a process which was known to the Greeks in Homeric times.

The negro smith, who still leads a wanderer's life, uses very simple tools. Anvil and hammer are frequently only two stones or pieces of iron. The hammer is sometimes furnished with straps or cords of bast to hold it by, but it never has a handle. A chisel or a spear-head is used for cutting and forming the more delicate parts of the red-hot

metal. The pincers consist of a half-split piece of wood or a similar instrument of iron with a movable ring.

With the exception of weapons, implements, and ornaments, the articles produced in this industry with the help of such simple means compete, to some extent, with the best of European wrought work. The above exception accounts for the small quantity of material used. But as soon as they are brought into the slightest connection with European culture, the primitive industry of the blacks succumbs rapidly to cheap European importations. Amongst all primitive nations there was always something mysterious about the smith and his work ever since the beginning of the Metal Age. As he is a stranger to the earlier demons, and hated by them, they are exorcised by iron, by nailing horse-shoes on the stable-doors, or by throwing knives in the contrary direction of the wind to compel the spirits riding the storm to turn back. The Arab hurls the word "iron" into the face of the "Djins" hidden in the sand-wind. On the other hand, we find ancient divinities worshipped on altars over the stones of which no iron has been swung. Similarly, the African negroes sometimes despise the smith, and sometimes they hold him in high respect, and both for the same reason.

All over Africa the smiths form a class by themselves; here the principle of division of labour obtains, whilst, for instance, weaving and pottery are carried on by all as domestic industries. The smiths are frequently of a different origin to that of the people, *i.e.* when the land was taken and the former inhabitants driven out, the smiths remained back and became an outcast class. Sometimes they came voluntarily at the call or request of those who were ignorant of their art and required its assistance, in which case the smith was highly honoured and respected. In some places on the Congo royal origin is attributed to him. Amongst other tribes they are priests and medicine-men at the same time. Sometimes the "Prince of the Iron-workers" is a Court appointment. Tribes which produce no iron

consequently worship bellows as a fetish, and among certain tribes of Western India, which have remained in a backward condition, spear-points or plough-shares are hung up on trees, and first-fruits or shares of spoil are brought to them as a sacrifice. This, however, would appear to be contradicted by the fact that, here and there in Africa, the smiths form a degraded class, into which not even a slave would marry; and the word "smith," if used as an offensive epithet, is a deadly insult.

With the exception of Egypt and the countries bordering the Mediterranean, Africa does not appear to have known a Copper or Bronze period as a connecting link between its Stone Age and Iron Age. Copper is not rare in Egypt, but is mined in a proper manner only in few localities, whence it is distributed in the ordinary way of trade. The mineral ore is smelted, like iron, in a coal furnace and delivered for transport in bars in the shape of rings, ovals, or crosses.

The cold-smelting of pure copper, as is done by the North American Indians, does not appear to have been customary in Africa. According to the frescoes in the temple of Medinet-Habu, Ramses III. of Egypt possessed large slabs of copper, silver, and lead in his treasure-chambers.

The Pharaohs received tribute from Syria and Assyria in the shape of copper-bricks. The bronze forming the material of so many ancient Egyptian articles which have been preserved to us was called by the same name as copper. But as tin cannot be traced in the written records and monuments covered with signs and symbols of the Ancient Egyptians, it must be assumed that they obtained many manufactured bronzes from Asia. Tin was not quite unknown to the primitive nations of Africa, but it was not used for producing bronze. They used copper chiefly for ornamental purposes as we do silver. They employ it in the manufacture of necklets, bracelets for arms and legs, coverings, long wire-ribbons for rolling round the handles of

swords and knives, spear-shafts and bows. Nobles carry weapons of copper. In Uganda, for instance, only kings and chiefs may carry spears with copper points. Some blacks, especially wives of chiefs, burden themselves with bracelets on arms and legs to such a degree that they are hindered in walking.

The blacks never cast iron and seldom copper, but on the Gold Coast they make rings, chains, brooches, and figures of animals of cast gold. They make a model in wax and a clay form over it, the wax is melted out and molten gold poured in.

(*b*) *Asia.*—We now turn to the Eastern, Southern, and Northern regions and islands of the largest of the great divisions of the earth, to Further Mora, Indo-China, to the island world of the Malay tribes, to the ancient East Asiatic kingdoms, and to the savage North of Asia.

Further India also had a Stone period which reached far back into past ages. Then followed a period of copper and bronze work. The Sanscrit word "ayas" originally only meant metal, *i.e.* copper or bronze "ore"; later on it signified iron.

In the ancient Indian epic "Mahabharata" iron is seldom mentioned; iron arrow-heads appear to have been introduced from the East. This would agree with an age similar to our Early European and Hallstadt period, or with the Homeric period, in which iron was known, but rarely used. Copper appears to have been produced in India in ancient epochs of culture, and used in the manufacture of axes, chisels, spear-heads, &c.

Tin for making bronze was procured from the West, as the rich sources of tin in Indo-China were not opened up till later. Old bronzes from India are rare. They consist more often of ornaments than of useful articles, and are not made of the same alloy as in the Occident. This disposes of the statement, which was now and again brought forward, that bronze was originally first produced in India, whence the knowledge of the alloy was spread East and West.

We do not know how far the production of iron in India dates back. The country is rich in iron ore; it is smelted in a very antiquated fashion by the natives, after the manner of the negroes. Amongst the half-savage mountain tribes it is always the same family which collects the mineral, produces the charcoal, manufactures the iron, and works it up into such articles as are required by the villagers. Frequently they go from place to place and build their clay furnaces where there is a demand for implements of iron and a good supply of ore and wood.

When they proceed on their journey they leave large quantities of slag to mark the spot of their activity.

The home product is sufficient for their requirements, and is cheaper than European iron.

The Indian smith is the counterpart of his African brother. His anvil is of stone, and his remaining tools consist merely of pincers, hammer, beater, and file. He works in a sitting posture like the negro, and like his relative the gipsy smith in Europe and Asia Minor. In the Indo-Chinese Peninsula, also, bronze belongs to an earlier age than iron.

The kingdom of Cambodia under French suzerainty deserves special mention. In this country traces of a later Stone Age have been met side by side with bronze finds.

In "kitchen-middens" on the banks of rivers, polished stone axes and stone chisels, similar to ancient European models, have been found lying next to bronze axe-blades, arrow-heads, fish-hooks, and rings which agree very nearly with the prehistoric bronzes of Europe. But, as the entire culture of the peninsula is under the influence of China, it appears that the knowledge of bronze must also have come to Indo-China from the ancient sphere of culture of China proper.

At the present day, in Cambodia, they have a certain ore from which they produce iron which is well adapted for welding and hammering, and here, as in Further India, it is used in a very primitive fashion for making axes, knives, saws, and agricultural implements.

In Burmah the production of iron is on a yet lower level.

In smelting it they do not even employ an artificial blast. Consequently the product is very impure, *i.e.* mixed with slag, pieces of unconsumed coal, sand, and other foreign bodies.

Nevertheless, when subjected to subsequent proper treatment at the hands of the smith, who turns it into knives and other articles, it develops excellent qualities.

The Malay Islands differ from the Asiatic continent, and approach nearer to African conditions, inasmuch as they had no Bronze Age, a direct transition being effected from stone to iron.

The inhabitants of the Malay Islands are capital workers in metal. They have special terms for gold, iron, and tin, but use Sanscrit names for silver, copper, and bronze, so that we might surmise that these metals were originally transplanted from the continent to the islands when the Brahmins penetrated from India to Java and built large temples, now in ruins.

The peninsula of Malacca and the isle of Sumatra are regarded as the place of origin of the Malay race. From there they spread in the East as far as New Guinea, in the North to the Philippines, and in the West to Madagascar.

Wherever they went, the Malays transplanted their peculiar and easily recognised method of producing iron, especially by means of the bellows. In the Philippine Islands the native Negritos have not risen to the height of a metal industry, as little, indeed, as the Papuans of New Guinea. It is intelligible that the Malays entertain great respect for the smith. In Java the word "Pandi" signifies both the smith and the learned man, and amongst the Igorrotes on the island of Luzon the smiths constitute the only and real labouring class.

The last-named tribe had long carried on copper mining and smelting.

For centuries the Spaniards of Manilla used the copper articles of the Igorrotes without troubling to ascertain whence they came. This Malay tribe employs fire in obtaining the ore. In the islands of the Malay Archipelago copper is found both pure and in ore, the former in primitive times having probably been hammered cold and worked up into various implements, whereupon, under Indian influence, they learnt the art of melting the metal and casting it. In the Indo-China peninsula the Malays have a very primitive method of obtaining tin, which is so indispensable for the production of bronze, and which, of all metals, is the easiest to manufacture from its ore.

But this method does not date very far back, and certainly not to prehistoric ages. The Arabian writers of the Middle Ages are the first to afford us precise information concerning the trade in Indian tin.

The soil of China holds the remnants of an obscure Stone Age.

In this large country there are provinces in which, not very long ago, axes and cutting instruments were made of hard flint, a circumstance which, on account of its peculiarity, has not escaped mention in written records. Tradition is even said to know the names of the various discoverers who in turn gave man a better material for the manufacture of his implements.

First came "Fuhi"; he made weapons of wood; then "Schimung" appeared and produced them of stone; and finally "Tschigu," who made them of metal.

The Stone Age was followed by a Bronze period, commencing in the second millennium before the Christian era and lasting until the first centuries of the last millennium B.C.

Remnants of this ancient period of culture are found in the Loess[1] (loam and sand layer), and considered very

[1] *Translator's Note.*—In addition to the explanations of the word "Loess" given on p. 27, I find on reference to "Prehistoric Europe," by James Geikie, LL.D., F.R.S., London, 1881 (Edward Stanford), p. 144, the following interesting remarks:—

"One of the most representative and typical of the qualities now

valuable. There are six different recipes for bronze mixtures for bells and cauldrons, axes and spears, knives, swords, arrow-heads, and mirrors, a fineness of distinction which far exceeds all that we have observed in prehistoric Europe.

According to Chinese traditions weapons, in old times, were made of copper, *i.e.* of bronze, but iron did not replace copper until a period which corresponds with the third century before the Christian era. In distant Japan, the anthropologist meets with phenomena of prehistoric culture which are quite similar to those of Europe, namely, shell-mounds or kjoekkenmoeddinge, kitchen-middens, mound-graves, burials in large stone troughs or chests containing amongst other things stone implements, which have only been hammered, or finely-smoothed tools of horn and bone, as well as some of bronze. The most primitive (only hewn) stone articles were found in shell-mounds, for instance near Amoria, in the Bay of Yeddo, without a trace of bronze.

The kitchen-middens (or scraps) indicate the degree of culture of a primeval population of Japan, justly regarded as the ancestors of the modern Ainos, who decorate their vessels of clay, to this day, with the primitive patterns to be found in those very ancient shell-mounds. Then there came, probably from the continent (of Asia), according to a

under review is the Loess of German Geologists. This may be shortly described as a yellow or pale greyish-brown, fine-grained, and more or less homogeneous, consistent, non-plastic loam consisting of an intimate admixture of clay and carbonate of lime. It is frequently minutely perforated by long vertical root-like tubes, which are lined with carbonate of lime, a structure which imparts to the Loess a strong tendency to cleave or divide in vertical planes. Thus it usually presents upright bluffs or cliffs upon the margins of streams and rivers which intersect it. Very often it contains concretions or nodules of irregular forms which are known in the Rhone District as Loessmaennchen or Loesspueppchen, and in that of the Danube as Loesskindeln. Land-shells and the remains of land animals are the most common fossils of the Loess, but occasionally freshwater shells and the bones of freshwater fish occur. Such is the typical character of the Loess." Readers who take a deeper interest in the subject will find more information in the above chapter.

questionable tradition, about 1240 B.C., a race of advanced culture, which drove the primeval tribe from its home and away to the North. These conquerors, the ancestors of the present Japanese, possessed polished and decorated weapons of stone and bronze. The stone weapons of these men are of choice material, such as can rarely or never be proved to have been natural to Japan. They are found in the earth and preserved in temples, as the Japanese regard them as relics of the "Kami," *i.e.* beings of a higher order, from which they derive their own origin.

According to their belief they also fall from the sky when raging spirits ride the winds.

At the present day mining and smelting are highly developed both in China and Japan, whilst in the latter country metallurgy ranks even higher than in Europe. The iron industry in China is very old, and, owing to the great wealth of mineral and coal, also very extensive, but it has this peculiarity, that in the productions of the raw material they use smelting-pots instead of furnaces, in which they manufacture cast-iron as well as wrought-iron. Mining was carried on in Japan towards the end of the eighth century after the commencement of the Christian era. Records of the seventeenth century relate the strange circumstance that at that time copper was the commonest of all metals, and they employed it for manufacturing nails, clasps, hooks, and other objects which were elsewhere made of iron, for iron was by no means cheaper—in fact it was dearer than copper or brass. It is of course impossible to talk of a Copper or Bronze period there, but in any case it shows us how the long possession of other metals and the knowledge of the method of treating them could stand in the way of a more important development of iron.

In Ancient Egypt we have already met with an example to prove this, from which we may derive much instruction, although some doubt is unreasonably cast upon it.

As regards metals, China and Japan form together one large clearly defined sphere of culture which may well vie

with that of Hither Asia and the Mediterranean countries, to which we shall refer later on. In the Western countries of the Old World, Hither Asia, together with Egypt, represent China, the slowly developing and "giving" country, whilst Europe, and especially the South, represents Japan, the "receiving" and further developing country.

But as culture emanated from one part of the Mediterranean regions and reached the Negro tribes of Africa, so was civilisation transplanted from China and Japan to the lower types of human beings in the North of Asia. When the Russians crossed the Ural in the seventeenth century and began the conquest of Siberia, they found but few tribes acquainted with iron and its treatment. Many of them only knew weapons and implements of wood, stone, and bone; some few rare iron tools reached them through trading channels. Like the South Sea Islanders on the landing of European ships, so the half-savage tribes of Siberia, on the arrival of the Russians, seized upon brandy, tobacco, and iron, and their insatiable appetite for this metal gave rise to very advantageous transactions of barter and exchange. An ordinary knife was the price of a sable fur, and for an iron or copper kettle one could obtain as many sable or black-fox furs as could be packed in it.

The Kamchatkans of the Stone Age were a nation of this character, even at the beginning of the eighteenth century. Their cuneiform axes of stone, walrus, or reindeer bone were jammed into knee-formed shafts like the ancient European stone axes. With miserable tools of this description they hollowed out their wooden canoes, dishes, and troughs, and it may well be imagined that this work took them a very long time. And yet we are astonished when we hear that it took them three years to finish a boat, and one year to make a wooden dish! But what value had time for the half-savage man, intellectually indolent and with scant physical requirements? It is scarcely credible that the very same nation should have produced articles of luxury, marvels of ingenuity, with such primitive tools! An

ancient traveller in Kamchatka once saw a chain forty centimetres long with the most delicate links carved out of a piece of walrus-tooth.

The Korjaeks, neighbours of the Kamchatkans, received iron from the Russians. They themselves do not know how to treat it, but they understand the art of tastefully inlaying their knives and spear-heads with copper wire.

Amongst the Tchukts, who live farther north, iron did not make its appearance till the end of the last century, but the new material was completely powerless against ancient prejudices. They receive American and European iron in large proportions, but it fails to exercise any important influence upon their habits and customs. Their sticks are tipped with iron, and they have iron rings to their sledges, but even now they prefer wood and bone to the new metal for their arrow-heads, fish-hooks, and spoons. Their hammers are generally of stone, and for igniting their fuel they use either steel and stone or the old wooden drill. Amongst such backward nations of Northern Asia there are, however, still some tribes which were acquainted with iron before the arrival of the Russians, a circumstance which, as a parallel to certain ancient European conditions, is deserving of full consideration. The Ostjaks are said to have produced iron formerly, but the art became lost when Russian trade supplied them with a cheaper article than they could themselves manufacture.

The Turkish tribe of Jacuts on the Lena have not abandoned the production of the metal by their ancient method in spite of Russian iron. This tribe is more acquainted with iron than any other, and proves that Metallurgy is by no means incompatible with a nomadic life. The Jacuts are excellent smiths. They make knives, axes, spear and arrow heads, bear spears, helmets, plates for leather-armour, scythes and shears, &c., and know how to ornament them in an artistic fashion. Much of their ironware is tinned or silvered. Northern Asia was inhabited by tribes which had a knowledge of iron not only prior to

the occupation of the country by the Russians, but there were tribes there at a much earlier age which were acquainted with other metals, especially copper, but not with iron.

These were the Tchuds (Cudaki) as they are called by tradition. The ancient mines of the Tchuds (Cudskije Kopi) extend from the Ural to the Altai, and as far as Transbaikalia.

In the Ural, where the Woguls do not carry on any mining operations but know of the Tchuds as a mining people, deep shafts and galleries, neither timbered nor supported, are to be found in all districts where ore is abundant.

These old mines, the continuations of which are still to be found in the majority of modern mines (at least in the Government of Orenberg), frequently yield very interesting finds; for instance, round cakes of fused copper, clay smelting-pots (but neither hearths nor furnaces), slag heaps, containing 2 per cent. of copper, copper weapons and flat axes and perforated hammers of various descriptions of stone. In the Altai Mountains there are old burrows for gold which have been driven more than ten metres deep, but do not reach the ore. The loose material containing the gold was worked with copper wedge-shaped hoes or mattocks; as beaters they used round stones with small grooves round them in which a strap was inserted to serve as a handle. We find similar implements in use among the iron smiths of Africa. As little was done to protect the workmen, we frequently discover the bones of buried miners. Next to one of them there still lay the leather bag containing the gold he had mined!

The burrows of the "Tchuds" (Tchudski) are of a purely pre-Iron Age. The similarity of the name and the reports from classical ages concerning Asiatic tribes of the North, who knew copper and gold but not iron, had already led people to identify the Tchuds with the Scythians. But the latter were not a uniform nation with a uniform degree of culture. The Tchuds have thus been considered the

ancestors of the modern Finn tribes, because, according to linguistic evidence, the earliest metallic art of the Finns was that of the coppersmith, and because the Finn names for bronze and iron were borrowed from strange Indo-Germanic languages.

Still richer finds were made in the graves of the Tchuds. "Accompanying gifts" from Tchud graves opened by robbers were to be found distributed over the regions along the Yenesei towards the north up to the point where the winter temperature often falls to 40° R. below zero. In the plains near Krasnoyarsk we meet with beautiful bronze knives, daggers, axes, and spear-heads partly ornamented with figures of animals. If we go up the Yenesei towards the south as far as the boundary of Mongolia, we find in a milder climate the centre of the area of graves which yielded these ancient metal articles. They are *tumuli* (grave-mounds or "Kurgans") which follow the banks of rivers and are distributed all over the shore regions, whilst the later graves of the "Kirghiz" lie in groups of from sixty to eighty mounds on the mountains on the fringe of the steppes.

The graves of the Kirghiz contain iron; those of the Tchuds, on the other hand, almost exclusively copper. The bodies of the latter were deposited in wooden receptacles covered with the bark of birch-trees or slabs of stone. The "accompanying gifts" were placed at the foot, and consisted of vessels of clay, copper kettles, wooden pots and pans, and copper tools of every description, whilst in the region of the belt or waist they placed pieces of ornamental work representing figures of animals (stags) sewn or riveted on leather; then daggers, knives, and other small articles. Remnants of head-ornaments are also found very frequently, such as silk material stitched with gold, furs, perforated bones of animals strung on cords, sticks with copper handles, &c. The sticks and dagger handles were wound round with ribbons of gold plate. Little plates of gold were worn as an ornament of the body.

But the graves of the Tchuds did not exclusively contain

unconsumed bodies, but we frequently discover next to one or several skeletons a little heap of calcined remains of bones of a person whose body had been burned on a pile after death.

The mysterious Tchuds, who knew little or nothing of iron, were followed on the Upper Yenesei, about the beginning of the Christian era, by a tribe of horsemen of Turkish stock, whose degree of culture could only be ascertained from their graves, which contained little copper, but many articles of iron, especially stirrups, portions of harness inlaid with gold and silver, silver trappings and gold plates, &c. Chinese sources tell us that the Turks in the Altai Mountains smelted iron and spread the art to a limited extent in Siberia.

Copper and iron must have been long known to Turkish tribes, since in all Turco-Tartar languages there are similar terms for both metals.

(*c*) *America.*—America affords us the interesting spectacle of a large continent inhabited by many tribes of different character, in which, with one single, strange exception, iron was totally unknown before the appearance of Europeans. All Western Europeans who participated in the discovery and development of the New World, the Spaniards, Portuguese, and English, and who carried culture and civilisation into that country, agree in this. We gather from their reports that this peculiar feature, the absence of iron, made a deep impression on all who came into contact with the Red Indians.

The artistic manner in which, for instance, the natives of Western Hayti produced idols, wood carvings, richly-carved chairs, and ornaments for ships' figureheads, as well as the poor implements of stone or shell employed in the manufacture of them, created the greatest astonishment and wonder. Metal was only used for articles of ornament. The Kaziks wore golden crowns, others had thin strips of gold hanging from their noses. But it was apparent that the red men were ignorant of the method of melting their gold, and only understood how to hammer it cold.

Cortez found the Mexicans, and Pizarro the Peruvians, much more developed.

In Mexico, on the arrival of the Europeans, copper and bronze existed as well as stone. The condition was one which we might term the "Restricted copper and bronze" Age. Although this period of culture in Europe dates back to a very remote epoch, as it corresponds with that of the pile-dwellings of the latest Stone and earliest Bronze Age, it ranks nevertheless in America considerably above the degree of culture of the people dwelling north and south of Mexico and Peru, who had not yet advanced in agriculture. In Mexico artificial drainage had already been employed. Weaving and dyeing, painting (the language of symbols), and architecture flourished. The goldsmith's art yielded excellent results. Cortez reported to the Emperor Charles V. that Montezuma possessed copies in gold, silver, coloured feathers, and precious stones, of everything in his empire. Amongst useful metals, copper, lead, and tin were known, but comparatively little appreciated. Implements and weapons of copper and bronze were seldom used, but stone objects were very frequent, especially articles of obsidian, the sharp splinters of which were used for the cutting edges of wooden swords, daggers, saws, and lances. Bone implements were also used.

Copper was employed for ornament as well as for tools, needles, rings, bells, figures of tortoises, axes, and spear-heads.

The scant use of this metal is further proved by the small size and the rarity of copper axes; we only know of copper spearheads from written traditions. The axes were cast in forms and finished off by hammering. They have short blades, like the ancient European flat axes, but the edge is elongated in such a manner that the whole blade assumes the shape of a T.

It is not improbable that these axes may once have circulated as money, like the iron axe-blades in Africa. Of these T axes they once found 276 specimens, 11 centi-

metres long and 15 centimetres wide, in two large clay vases.

The Mexicans are said to have known the art of hardening copper to such a degree that they could fell trees and even work stone with tools made of such hardened copper, whilst similar experiments with ancient European copper axes entirely failed; copper without the addition of tin is suitable for weapons, but not for tools, whilst bronze properly treated can be used with the hardest substances. But the Mexicans were only beginners in the use of bronze.

Old American bronzes, which are very rare, contain 9 to 10 per cent. of tin, like the ancient European, but the employment of this proportion was not due to external influences.

The science of metallurgy and the practical use of metals amongst the Azteks may be regarded as the natural creation of a state of culture peculiarly their own, and in general of a high degree of development. They knew how to cast and hammer metals, but not to solder them. Metal founders and goldsmiths formed a highly respected class, to whose tutelary god, on fixed days of the year, human beings were sacrificed. The decadence of the native metal industry began immediately after the conquest of the country by the Spaniards.

The influence of old Mexican culture extends at the most to the Isthmus of Panama, where we meet with a new sphere of civilisation; in the first instance, in the dwellings of the Chibcha Indians, whose remarkable character was independently acquired and not influenced by that of Mexico. The Chibchas understood the production of gold, silver, copper, and bronze; the two latter metals serving only exceptionally for weapons and implements, which were generally made of stone: gold was the substance which led them to learn the art of treating metals, and they knew how to melt, cast, chase, and solder it. The tools they used for these purposes were made either of stone or of some gold and copper alloy. They manufactured jewellery, ear-rings, nose pendants, belts, breastplates, vases, and figures of human beings and animals, tor-

toises, lizards, birds, and fishes. Plants as ornaments were unknown. The extremely rudimentary figures are of cast plates of metal, the outline and the interior lines of the sketch being indicated by means of threads of metal soldered on. Work of this kind was sometimes, though very rarely, executed in bronze.

It is a remarkable fact that such important and comparatively highly civilised states as Mexico and Peru had no intercourse with one another. Indeed they would very soon have come into contact, had not European conquerors interfered between them as a disturbing and destroying element. The country inhabited by the Peruvians is very rich in iron, and yet they were unacquainted with the metal. Their knowledge was restricted to precious metals, copper, tin, and lead.

These they were able to produce from their mineral ores, to alloy, cast, work, hammer, and solder them. Mining at the present day gives its occupation to thousands of Indians living in the valleys of Peru, and at that time was extensively carried on. Tho smelting furnaces were of clay, and bellows were unknown. The graves and treasure chambers of the Incas prove that the Peruvian goldsmiths were not inferior in point of cleverness to their social equals in ancient Mexico. They manufactured golden necklets, bracelets, vases, silver mirrors, carriages, and bells, using wax as the modelling medium; tools and weapons were made of copper or bronze. Peru ranked higher than Mexico in culture, inasmuch as in the former country they chiefly used bronze rather than pure copper, which latter was employed for discs and half-moons, idols, figures of animals, serpents, sticks, stars (morning-stars), and axes. Peruvian bronze also exhibits a different form of alloy to that of Mexican bronze, which is a further proof of the independence of the two large bronze areas. Strictly speaking, there was in Peru no fixed proportion for mixing metals from which bronze is produced. They cast bronze lances, arrow-heads, chisel-shaped agricultural implements, spades, ladles, and axe-blades. These were so numerous that

after the introduction of the more valuable iron they could be sold by the hundredweight. From Peru the bronze culture spread southwards to Chili, where we not infrequently find bronzes of Peruvian type.

Farther south, then, to the west of Peru and to the north of Mexico, there lived numbers of Indians who had not yet made the least step towards that stage of human culture in which the more important metals are used. In North America they found and employed meteoric iron and pure copper, but were unacquainted both with the extraction of the metal from the ore and its further treatment by fire.

Amongst the Esquimaux the appearance of pure meteoric iron had absolutely no influence upon them in regard to culture.

Pure copper is found in many river-territories, especially in the native copper district of Lake Superior, in great abundance. These districts were, long before the arrival of the Europeans, the destination of innumerable Indians, who wandered from afar, and used the metal for making knives and daggers, awls, ice-hooks, axes, lance and arrow heads. Most extensive were the operations carried on in copper-mining in the district of Lake Superior. Shafts were discovered five metres deep, wooden scaffolding as pile work, a rough ladder, a colossal lump of copper, tremendous stone hammers, smaller mallets, also a copper hammer, wooden vessels for emptying ditches, &c.

Traces of such mining activity extended for over thirty English miles, but the industry must have ceased long ago, judging by the old trees now on the mounds of tailings. The miners of this district were the ancestors of the present Indians, who, however, abandoned the mines soon after the appearance of the white man. Their descendants have retained scarcely any knowledge or obscure remembrance of them, but still in the seventeenth century finds of ancient copper were regarded with great veneration and as a sort of fetish.

From Lake Superior copper was carried far and wide

through the medium of barter and exchange, in the south as far as the Gulf States, in the east to the Atlantic, and in the west to the Mississippi. Finds of copper become more frequent the nearer we approach the lake regions, and it is indicative of the appreciation of the metal that in the neighbourhood of that region we principally meet weapons and tools of copper, such as axes, arrow-heads, knives, and awls, and further off, chiefly ornaments, thin sticks, rings, and beads, &c. Altogether ancient American articles of copper are rather rare, especially in comparison to the huge quantities of stone articles which are found. Immediately after the arrival of the Europeans the Spanish sphere of culture in North America extended as far as South California. Since the year 1542, when the Californian coasts were visited by Spanish ships by order of the Viceroy of Mexico, the graves of the Indians show numerous articles of Spanish industry, such as weapons, silver spoons, cups, &c. Iron was in high esteem. Even small pieces were sharpened and inserted in wooden handles. In an Indian grave of Yucatan they found an ancient European horn-handled penknife side by side with pearl and shell ornaments, and a few clay urns full of shavings of obsidian. Consequently the Indians accommodated themselves neither to the native production of iron, nor to learning the art of forging it. They contented themselves with replacing their flint arrow-heads by iron ones, but this was European hoop-iron sharpened by simple cold treatment on stones.

Iron was introduced into North California and the more northern regions of the American North-West from Western Asia, and not from the Spanish sphere of culture, nor from the East. Quite in the North there were points of contact between the Old and the New World without any difficulty, but they did not develop to any extent until the appearance of the Russian fur-merchants. Some tribes, however, were acquainted with iron prior to the discovery of those coasts, and it is not improbable that it was brought there by weather-driven Japanese vessels ; in proof of which we would point

to the Patagonians of South America, who search the wrecks of stranded ships especially for iron, in order to hammer it cold, and make it into knives and axes. As a matter of fact we actually find tribes in Unalaschka, at the end of the last century, long after iron had been brought there by the Russians, still using bone-needles and spears with bone points.

The language of the Indians did not possess a special word for iron, as they were not acquainted with it, nor did they eventually accept the European term, but they formed new expressions for it. Thus the Mexicans called it "Black Copper," the Ketchuans and the Araucans simply "metal"; the latter called copper "red metal." The Indians of Costa Rica escaped the difficulty by using the word "knife" as a synonym for iron, for which reason they called an iron saucepan a "knife clay vessel." In the north-west of the New World iron is simply called "black."

(*d*) *The South Sea Islands*.—Nations without any knowledge whatever of iron are met with, even in historic times, all over the world. Travellers at the present day discover tribes in South America and Central Africa among which stone and wood take the place of iron or copper, but also, on the other hand, groups of people who have become acquainted with metals without the assistance of Europeans, and thus attained a higher or lower degree of culture. In the South Sea Islands the case is different. Those little islands, spread about the ocean, produced no metals, owing to their peculiar geological formation. The inhabitants therefore received their iron through the Spaniards who landed on their shores, and were the only source whence they could obtain metal in exchange for the products of their islands. They also greedily seized upon the iron in stranded ships, and even drew the anchors out of the depths of the sea. Later on the English brought large quantities of iron to these islands. Cook, who on one of his first journeys had introduced it into New Zealand, subsequently found that the Maoris despised coral beads, ribbons, and coloured paper, and demanded nails and

axes. Although these intelligent people at the time of Cook's first voyage were completely indifferent to the iron offered them, a man to whom the navigator had presented nine or ten axe-blades and perhaps forty large nails was now regarded as the richest in all New Zealand, and in exchange for a very little iron they brought the travellers a quantity of slaughtered pigs, dogs, or fowls.

The same was the case on other islands, especially on the smaller ones, whither the knowledge of iron soon found its way, owing to the important shipping expeditions of the inhabitants. On the larger islands the metal encountered greater difficulties, and whilst the Papuans on the west coast of New Guinea became acquainted with it through the Malays, it is to this day absolutely missing among the tribes of the east of this island. The possession of a single little piece of iron, out of which they could fashion a rude, but terrible weapon, increased the repute of an entire tribe. It was not until the seventies of our century that matters changed in consequence of the abundant shipments, and thus, reviewing the whole universe, New Guinea was the last to become acquainted with iron.

As was the case in America, from Patagonia to Greenland, so it was in the South Sea Islands; primitive tribes worked up iron into the forms with which they were familiar from their own stone and shell implements.

As axe-blades they used flat chisel-shaped metal plates, which were inserted in wooden shafts bent in the form of knees. Planed iron, on account of its suitable form, without further treatment was inserted in these shafts, and the work was now done most expeditiously as compared with formerly. One would have thought that the provision of a sufficient supply of iron would have had a beneficial effect upon the entire life of these insular folks, but unfortunately the contrary happened.

In the first instance, the new metal created such feelings of envy that they had no hesitation in securing it by theft or by the sale of their wives, daughters, or sisters. Moreover, it

did not tend to increase love of labour, but only afforded opportunities for idleness, which is innate in all primitive races. Formerly they had to work hard in order to produce a stone axe to fell a tree or build a boat. The most simple requirements could only be satisfied by the aid of the most defective tools. Now this wholesome compulsion disappeared.

"The iron of the European," says a writer describing these islands, "followed too closely upon the stone of the savage, and the necessary consequence was that the latter fell ill and pined away, morally and physically, as an effect of that which should have been a blessing."

Having thus surveyed the whole universe down to the present day, let us return to the two large groups of men who in prehistoric times inhabited Western Asia and Europe, and laid the foundations of the higher development of mankind. The activity of these groups, first the Semitic and then the Aryan people, has in marvellous manner created that civilising culture which has proved so important and spread in countless off-shoots over the principal portion of the inhabited globe.

II. Metals in the East and in Greece.—In Egypt iron does not appear to have attained any degree of importance as a metal of culture until about 1500 B.C. Previously, especially in the "Old Kingdom," in the time of the builders of the Pyramids, its place was taken by bronze, and, at an earlier date, by pure copper, which latter, in after times, may have been used for non-cutting implements. The Egyptians obtained copper in the western part of the Sinaitic peninsula, whilst tin had to be obtained from more distant countries. For this reason, we find amongst ancient Egyptian articles many objects of bronze containing very little tin. The ordinary quantity of tin in ancient Egyptian bronzes is $12\frac{1}{2}$ per cent.; in some cases we find 5 per cent. of tin and 95 per cent. of copper. The Greek writer, Agatharchides, who lived about 100 B.C., says that bronze chisels were

found in ancient Egyptian gold mines because they were previously unacquainted with iron. This is proved by the frescoes on Egyptian buildings, in which all weapons and implements were painted red or yellow. The subsequent terms for iron originally only signified "Metal." Nor could Greece, Asia Minor, and the islands of the Eastern Mediterranean have still possessed an "Ironless" bronze culture in the fifteenth to the twelfth century before the Christian era (as the so-called "Mycenæan" finds teach) if Egypt, so near and so influential, had at that time already been well acquainted with iron.

Flinders-Petrie has examined the ruins of two very old towns in the Egyptian district of El-Fayum, one called "Kahun," which flourished under the "XII. Dynasty" in the "Old Kingdom," and the other "Gurob" in the beginning of the "New Kingdom."

The ruins of the former yielded numerous well-made stone implements, whilst in the latter he found a smaller number of stone articles which were not so well manufactured; neither town showed even a trace of iron.

This agrees with historical tradition, which does not mention iron until the reign of Ramses II., the great Conqueror "Sesostris" of the thirteenth century. As so many papyri and objects of wood have been preserved in the soil of Egypt, it cannot be inferred that the iron in the ground has perished by rust. In the ruins of Naukratis (which flourished later) many well-preserved iron articles have been found.

In Chaldæa and Assyria the oldest historical culture known is also based upon the material foundation of an extensive use of bronze.

Iron was not known until a later date, and then only as a rarity. It was used for making rings and other ornaments almost as one of the precious metals. The graves of this period (the second half of the third to the end of the second Millennium before the Christian era) are situated

near Mugheir and Warka. Mugheir, the asphalt city, is the ancient Ur, not far from the mouth of the Euphrates. Warka is the ancient "Erech," a little higher up the Euphrates, but far below Babylon.

In the "accompanying gifts" there are articles of stone, copper, bronze, lead, and gold, but none of silver. Iron does not appear as a decorative metal until the end of the above-mentioned age.

The great finds of bronze at Tell Sifr, to the north of Mugheir, between the Euphrates and the Tigris, date from the same period. This find, which Layard acquired for the British Museum in the year 1856, exhibits the weapons and implements of the Chaldæan Bronze periods; daggers, knives, pointed axes, hatchets, and hoes. They are simple implements, suitable for their respective purposes, without any decoration; two-edged swords or hollow celts with knee-shaped bent shafts are missing. Some are similar to Egyptian types and indicate intercourse with the land of the Nile, as is proved by history.

Persia is also rich in finds of the Bronze period, *e.g.* at Astrabad, in the south-east of the Caspian Sea. These discoveries are situated in the territory into which the Iranian horsemen, the Massagetes, once penetrated, and who, according to Herodotus, in the year 500 B.C., only knew of copper, bronze, and gold, but not of iron. More opportunities for study are afforded by the numerous burial-grounds in the Caucasus, south of Tiflis (Redkin - Lager, Muci - Yeri, Cheitan-Dagh), and to the north-west of the town of Samthawro, and finally on the northern slope of the Koban Mountains.

They belong partly to the last period of the Bronze Age, partly to the purely Iron Age. The cemeteries of Koban are probably the most ancient of these grave-fields. Here we frequently meet with bronze weapons, but seldom with articles of iron. Swords are not found. The shape of some of the bronze daggers seems to indicate Assyrian origin. The appearance of the Cowry-snail (Cowry-shell, *Cypræa*

moneta) in these graves shows intercourse with the countries on the Persian Gulf or Indian Ocean. On the other hand, the form of the bronze axes and the preference for ornaments in the shape of animals, points to the Siberian Bronze Age of the graves of the Tchuds. Still more remarkable is the agreement of so many types with similar ones of Central and Southern Europe.

The Caucasian graves contain necklets and spiral bracelets, scythes, and hollow celts as we recognise them in the central or upper Danubian districts, fibulæ or pins with semicircular, folded, ribbed or engraved handle, as they are also found in Greece and Italy. The ornamentation on daggers, axes, belt-plates, &c., frequently consists of continuous spirals.

The most ancient graves in the Caucasus, according to Virchow, belong to the eleventh and tenth centuries before the Christian era. But there must have been a previous long and completely ironless Bronze period during which the characteristic types passed through that development the results of which are now before us.

What interests us chiefly on the Mediterranean coast of Hither Asia is the Holy Land, with its ancient and venerable written records. The books of the Old Testament mention most of the metals employed at the present day for industrial purposes, such as gold, silver, iron, tin, lead, and copper. The Hebrew word generally translated by "copper" signifies copper in most cases, but sometimes also bronze. According to the Bible, there lived in the seventh generation after Adam, Tubal Cain, a "master in all copper (mineral) and iron work." But this tradition does not rest on any trustworthy knowledge of antiquity. The undoubted mention of iron weapons and tools does not occur until we come to the history of the time subsequent to the exodus of the Israelites from Egypt. In the whole of the five books of Moses, iron is only mentioned thirteen times, whilst "copper" is referred to forty-four times. Thus the knowledge and use of copper and bronze appear here also to have preceded that of iron.

Between Hither Asia and Greece lies the Island of

Cyprus, important in the earliest history of metals on account of its favoured situation and rich copper mines. A pure Stone Age was here also followed early by a long period of copper, the traces of which are to be found in oblong graves. The copper articles do not contain any intentional addition of tin. Their form is simple, and without ornamentation.

There are flat axes without rim-edges (never perforated), and daggers with long handles and bent points. Weapons of defence are missing. Gold and silver are rare. The fibula or pin was unknown. They had flat clay idols, always clothed, and clay vessels which first appear without ornamentation, but, in the course of development, they were provided with straight lines and etched patterns filled up with some white substance. Some Babylonian seal-cylinders with figures and cuneiform inscriptions are of foreign origin, and, according to this evidence, their age would be about 3800 B.C.

This Copper Age was also followed by a long Bronze period, during which we find the tin contained in bronzes first in small and then in larger quantities. Then we meet with lance-heads with loops, first open loops formed by simply hammering the edges together, then closed, *i.e.* already formed in the casting, single and double axes, with perforation for the shaft and swords, but no metal weapons of defence, no fibula or pins. The female idols were clothed, but we find some already without clothing.

The earthenware vessels of earlier times were painted with geometrical designs, and later in the so-called "Mycenæan" style. Foreign objects, such as glass pearls, scarabæi, and ivory, point to Egyptian influence under Thotmes III. about 1500 B.C. This Bronze Age is again followed in its turn by an Iron Age under the influence of Greece and Phœnicia. In this period, weapons of attack—with the exception of arrow-heads—are made of iron. Bronze is used for defensive weapons, fibulæ or pins, lamps, candlesticks, mirrors, and other similar articles. Buildings and statues are made of stone. We may assume for the

whole western portion of Asia Minor the same sequence as in Cyprus, as is proved by the example of Troy.

The ruins of Hissarlik, in which Schliemann discovered the site of ancient Troy, contain a series of layers of buildings and building materials which are divided into three great periods.



FIG. 22.—Double-handled Clay Goblet (Hissarlik—Troy).

I. *Pre-Mycenæan or Prehistoric Layer.*

1. The lowest primeval settlement, of which only a small portion has been examined. Walls of small broken stone and clay. Primitive finds. No iron and no bronze, but copper and stone, flat and perforated stone axes, knives and flint saws, vessels of clay of simple form with etched line ornamentations filled up with white.

Period: approximately, 3000–2500 B.C.

2. Stately castles with strong battlements, large dwelling-houses of clay bricks. Thrice destroyed and rebuilt, their remains constitute about one-third of the entire mass of ruins. Numerous articles of stone, bronze, silver, and gold. Monochrome vessels of clay, not yet ornamented with paintings—amongst them the characteristic type of the great double-handled goblet (Fig. 22) and the "Face-urn" (Fig. 23). This "prehistoric Trojan stronghold" was formerly called the "burnt town," and wrongly regarded as the seat of Priam's sovereignty, the subject of Homer's epic.



FIG. 23.—Clay Face-Urn (Hissarlik—Troy).

Approximate Period: 2500–2000 B.C.

3–5. Three village-like prehistoric settlements, which were in turn built over the ruins of the "burnt town." Dwellings of small stones and loam bricks. Bronze and stone weapons, but no painted clay vessels, but similar ancient Trojan pottery, also "face vases," as in 2.

Period about 2000–1500 B.C.

II. *Mycenæan Layer.*

6. Homeric Pergamos. Mighty castle-walls with a large turret, and stately houses built of well-hewn stone. Bronze and stone weapons, but no iron. Developed monochrome Trojan pottery side by side with imported Mycenæan painted vases.

Period about 1500–1000 B.C.

III. *Post-Mycenæan Layers.*

7 and 8. Village-like settlements of ancient Grecian and later Hellenistic periods. Two separate layers of simple

store-houses above the ruins of Mycenæan Troy. Implements and weapons of iron. Native monochrome pottery, and nearly all the known descriptions of Grecian ceramics.

Period about 1000 B.C. to about the Christian era.

9. The Acropolis of the Roman town of Ilion. Ruins of a celebrated temple of Athena and other splendid buildings of marble. Roman clay vessels and numerous other objects. Inscriptions on marble.

Period from the Christian era to about 500 A.D.

Taking an average of the Hissarlik layers, we obtain an idea of the development of Man in a permanent settlement on the Eastern Mediterranean coasts from the beginning of the third millennium before the Christian era to the middle of the first millennium afterwards. We see how the greater portion of this long period, about 2000 years, belongs to the Copper and Bronze Age, whilst the dawn of the first Iron Age does not appear until the beginning of the last millennium before the Christian era, simultaneously with the inauguration of historical culture.

Graves of a very ancient Bronze period have also been discovered on the islands which stand out like pier-heads between Hither Asia and Greece—for instance, on the Cyclades Amorgos and Melos. On the island of Thera (Santorin) there are ruins of the same period.

The most valuable discoveries, however, were made by Schliemann on the Greek continent in the ancient ruins of Mycenæ and Tiryns, not far from Nauplia.

The celebrated graves on the stronghold of Mycenæ, six in number (of which five were opened in 1876, and one in 1877), contained the remains of seventeen adults and two children. As "accompanying gifts" they found weapons next to the men, ornaments next to the women, and vessels of gold, silver, copper, alabaster, and clay besides.

The amount of gold in the five graves was one hundred pounds weight; weapons and implements were of bronze, only arrow-heads and knives of obsidian; there was not a trace

of iron. The bronze weapons were the following: Daggers (sometimes very beautifully inlaid with gold), swords (single or double edged, the latter very long and narrow, with wooden handles covered with gold, partly also with bone or alabaster knobs); spear-heads (seldom with cast-loops), and flat axes (no axes with perforations for shafts).

The ornaments, picture work, and other decorations exhibit a peculiar style, but one clearly influenced by oriental fashions. Numerous pearls of Baltic amber point to intercourse with the North. Many articles which belong to a somewhat later Bronze Age can be traced to the layer of earth over the graves.

In the ruins of a royal palace on a mountain-peak they found the walls decorated with frescoes, and, amongst other things, a scarabæus with the name of the Egyptian Queen Ti, who lived towards the end of the fifteenth century B.C.

Schliemann discovered a palace of the same period on a mountain stronghold surrounded by a wall of gigantic proportions. In these ruins iron was entirely missing. On the other hand innumerable knives and arrow-heads of obsidian were found, and a typical bronze double axe. They also discovered in the lowest building layers of the Athenian Acropolis a stock of old bronzes which, in point of form, agreed entirely with the shape of Mycenæan weapons, especially those from the layer of earth over the graves. The ancient sepulchral chambers on the Grecian continent should also be mentioned here. Some are large brick-built chambers with cupolas over them, a circular principal room, and a long corridor. In Mycenæ there are seven (of later age than the pit graves); at the "Heræon," not far from Mycenæ, one; in Sparta, two; in Menidi, north of Athens, one; near Orchomenos, in Bœotia, one; near Dimini, in the south-east of Thessaly, one—altogether thirteen.

Similar royal sepulchres are to be found in the Crimea and in Etruria.

More numerous are the smaller, square sepulchral chambers (graves of the people) near and in Mycenæ, Nauplia, Sparta,

Athens, Antikyra (Phocis), Volo (Thessaly), and on the Greek islands of Melos and Ialysos, &c. They are not to be confused with the type of the older stone trough-graves of Amorgos, &c. That they belong to the end of the Bronze Age is proved by some new indications; for instance, by the fibula or pin in the simplest form in the "people's graves" in Mycenæ, and by the appearance of iron in the form of finger-rings.

Remarkable are the simple forms of implements and weapons during the whole period of the Bronze Age in Hither Asia and Greece as compared with the great development of the same primitive type in Italy and the rest of Europe.

Comparisons with Egyptian monuments and finds enable us to fix somewhat definitely the age of the Grecian Bronze period. Especially convincing coincidences point to the time of the 18th Dynasty of the Pharaohs, about 1400 B.C. About the year 1000 B.C. iron must already have been known in Greece, although, as the Homeric epics appear to show, it was not very much used. Thus the Grecian Bronze Age would fall about 2000 to 1100 B.C.

According to credible ancient traditions the immigration of the Doric race took place about 1100 B.C. The Dorians were the last Grecian tribe which set out from a northern home to conquer Hellas. We must, therefore, place the first appearance of the older Grecian tribes, the Achæans, the Minyans, and others, a few centuries earlier. We thus obtain a series of inferences which are very valuable from an ethnological point of view in connection with the history of culture. We may ascribe the Mycenæan period, *i.e.* the last and highest stage of the Bronze Age in Greece, to the Achæans, sung by Homer, and the following so-called "Dipylon" period, or the first Iron Age of Greece, to the Greek tribes after the Doric immigration. Prior to the appearance of the Achæans, about 2000 B.C., and in the early centuries of the penultimate millennium, Greece and her islands were inhabited by non-Grecian tribes, whose culture (the earlier stage of the Bronze period), however, was favourably affected by the neighbourhood of the advanced

civilisation of Hither Asia (Syria). The Achæans assimilated with these primitive "Pelasgi," assuming their culture, and developing it under the continued beneficent influence of the East into the peculiar characteristics of Mycenæan culture.

Mycenæan culture is consequently, according to its true origin, non-Grecian, but the Greeks participated in its development, and there are clear indications of the transition of Grecian intellect and Grecian work from the Mycenæan into the Archaic-Grecian period.

9. The Bronze Age.

How did it come about that the appearance of the Bronze Age put an end to the later Stone period, and impressed a new stamp on European culture? We see that in the south-east, in ancient Egypt and in Hither Asia, prior to the rule of iron, bronze played an important part. It is consequently from there that our continent derived its knowledge of the ancient brilliant metal of civilisation. But the distance from those countries to the heart of our world is great, and we do not even know through which seas and provinces it has taken its course. To the east of the Alps lies Hungary, whilst Italy is in the south, a country which absorbed foreign civilising elements at an early date. The most ancient articles of bronze were probably brought to the Central Danubian regions overland through Thrace, and to Italy by sea; thence on the Danube and on the Rhone in a northerly direction.

The course of the metal was a rapid one. It was greedily accepted everywhere. The ingenuity of those who received it is displayed in a remarkable manner in the articles made. In regard to form European bronzes exhibit little in common with Oriental articles made of the same metal. Only the most ancient objects disclose the fact that the ground type was a borrowed one and the proportions of copper and tin were identical. Those are unmistakable indications of the origin of European bronzes, but later on we see European

nations spontaneously casting, hammering, and chasing bronze and inventing new forms or varying old ones.

The connection with Eastern traders, once made, appears during all prehistoric periods never to have been broken off, and the European bronze industry is indebted to this connection for continuous fresh encouragement and enrichment.



FIG. 24.—Bronze Razor.

In Hungary, Switzerland, North Germany, Scandinavia, and Great Britain a long period was inaugurated which, in Central Europe, they called "The Beautiful Bronze Age." The types of this period are more numerous, more elegant, and more suitable than those of the earlier Bronze Age.

We shall now give a short résumé of the forms which are the characteristic features of the two stages of the Bronze Age in Central Europe.

(*a*) *Earlier Bronze Age.*—Flat axes with smooth edges or narrow rims running almost to the edge of the blade. Axes in which the rims only reach as far as the centre of the blade, and are there joined by a downward gradation. Daggers with treble-edged blades and cylindrical handles. The latter were often of wood, bone, or horn, and have, therefore, not been preserved. Swords with short blades, also frequently treble-edged, and broad handle-ends or full, short, ornamented handles. Razors with double edge (Fig. 24). Scythes with a slight curve. Ornamental needles terminating in two spiral discs. Double needles. Needles with horizontal, wheel-shaped heads. Short, thick bracelets.

(*b*) *Later Bronze Age.*—Axes with shaft lappets (Palstaves), *i.e.* with wing-like additions embracing the split

end of the knee-shaped shaft. Hollow axes, *i.e.* axe-blades with loops for the unsplit ends of the shaft. These, as well as the lappet axes, often have eyes for the purpose of tying the blade to the shaft and effecting a firmer joint.

Chisels with level or concave edge (hollow chisels), saws, awls, and scythes with a marked curve. The scythes of the Bronze Age are always cast from a one-sided form, and are perfectly flat at the back.

Knives of elegant shape and various, often very beautifully etched ornamentation in groups of lines.

For wooden or horn handles they are provided with a hook, seldom with a loop. Sometimes we find blade and handle cast in one single form.

Daggers in the form of willow leaves with rivet holes for the handle, or with broad handle extensions, to which the guard was riveted.

Swords with full, beautifully etched bronze handles, or with flat, rimmed handle-extension. The blades are in the form of bulrushes, with sharp points, longer than they used to be, and very finely etched.

Together with these types we find single-edged razors and numerous ornaments, especially pendants, buttons, needles with cast heads drawn in profile; large, hollow bracelets etched on the outside in the form of horse-shoes with sponges at the ends.

The weapons and implements of the Bronze period are only superior in point of form to the types of the later Stone Age (with which it is related) by virtue of their more finished workmanship and larger variety. The difference between them is by far not so great as between the forms of the earlier and later Stone Age. We know less of the ornaments of the latter, as they were partly made of perishable materials. The Bronze period, by its ornaments of a more permanent metal, thus affords the appearance of superiority over the previous stages of culture.

Amongst the finds of the later Bronze Age in the Swiss pile-dwellings there are many which show clearly that during

this period in the neighbouring Italian peninsula both the early Bronze Age of the Terramare and the Bronze Age had generally ceased, and been replaced by an early Iron Age with a new metal of culture and partly by altogether new forms. Such articles are the following:—

Goblets of hammered bronze, swords, the knobs of which terminated in two spirals turned towards one another, dress-pins[1] in which the long pin was twisted to give it a spring, and had a loop at the other end of the shoulder-piece, which was generally ornamented.

Let us now turn from the Pile-dwellings of Switzerland and the Boden See, further north to the Central Rhine territories, and we shall find very much the same types of the Bronze Age. Some deviations explain themselves by their connection with other territories. Thus we frequently meet with axe-blades having pointed instead of straight ends, as found in the upper and central districts of the Danube, and swords of a shape often seen in Hungary and Austria. Other types disclose their origin by their similarity with French finds, and point to the valley of the Rhone as their probable home. The same may be said of the axe with graduated ends, a type of axe found in the Northern Bronze periods. On the other hand the offshoots of the latter extend into the regions of the Rhine and even into Switzerland, as is proved by the discovery of a bronze vessel and a dress-pin of northern shape in the Neuenburger Lake.

The characteristic features of the South German Bronze Age are certain horseshoe-shaped bracelets. They are widely open, oval circlets, with more or less projecting sponges or knobs. In the earlier period the circlets were of massive metal, the knobs small; in the later period the circlet becomes broader, hollow inside (with rims), and the knobs project very much. We also meet with bracelets consisting of flat, broad, and generally long-ribbed bands, narrowing towards the open ends, and broadening out again.

[1] *Translator's Note.*—Like the modern "safety-pin" of the nursery.

In addition to these flat bracelets, South-West Germany possesses similar bands, which narrow out and terminate in two small spiral wires on each side. Besides these we still find in the South German sepulchral mounds of the Bronze Age large bronze pins, amongst them the characteristic wheel-pin, the head of which forms a vertical filigree disc in the shape of a wheel, and bronze daggers.

Numerous discoveries of this description were made in the sepulchral mounds of Upper Bavaria between the Ammer See and the Staffel See. During the Bronze period here it was customary to bury bodies uncremated; later on burning prevailed. The "accompanying gifts" were generally an urn and a goblet, then swords, waist-bands, large pins with heads of spiral wire discs, head-bands with hooks and eyes, various pendants (like spectacles with two spiral wire discs, heart-shaped filigree work, wheel-shaped, &c.), finally pincers, and rolls of spiral wire, which were worn round the neck on strings. The clay pottery was in point of form and decoration different to that of the subsequent earlier Iron Age. The vessels display rows of rounded impressions under the edge and on the shoulder part, belts of vertical furrows on the upper concave portion, little bends, and handles. In the later Bronze Age the hollowed-out ornaments are filled up with some white substance.

The various countries of Europe in which bronze was the first metal extensively used by man were never altogether isolated or out of contact with one another. In the earlier Bronze Age the same simple forms prevailed almost everywhere, a proof that the dissemination and imitation of the models just introduced must have taken place very rapidly and almost simultaneously everywhere.

In the later Bronze Age different countries followed different paths, and it is clearly shown what part the vertical and horizontal division of our continent played in connection with it.

We distinguish in Europe countries which had a brilliant and highly developed or lasting Bronze Age, and others which had a short-lived one, prematurely terminated. The former

participated in both the above-mentioned stages of the Bronze Age, and the latter only lived to see one, namely, the first.

The countries with a short Bronze period include Greece and Italy in the south, then in Central Europe those territories which were easily accessible from the east, *i.e.* by sea through the northern portions of the Mediterranean—that is, the region between the Adriatic and the Upper Danube (what is now called South Austria, or the zone of the Eastern Alps)—and finally, the basins of the Rhone in the south of France.

Lasting Bronze periods were vouchsafed in Central Europe to the countries north of the Balkans and of the Apennine Peninsula, *i.e.* Hungary and Switzerland, then to the North German deep-lying plains, and finally, to the whole of Northern Europe, especially Denmark, Sweden, and Great Britain.

The different degrees of development of Bronze culture is accounted for by the fact that the knowledge of iron, its treatment, and the style of the Iron Age found their way through Europe from the South. Wherever this movement in civilisation appeared first, there the higher development of Bronze culture was impeded; wherever it penetrated subsequently, there we find Bronze culture enjoying to the fullest extent its second great stage of development.

For this reason we regard the Hungarian, Swiss, and Northern Bronze Ages as great and brilliant phenomena in prehistoric European times, whilst the Bronze periods of Greece, Italy, the Eastern Alps, and France were formerly almost passed over, and even now, although undeniably proved, make a less deep impression than the long durations of Bronze culture.

If we endeavour to estimate the various durations of the Bronze Age in Europe, we shall have to fix the first phase (which is at the same time the only one for the countries with a short Bronze period) at about 1500 to 1000 B.C.; the second lasted in Northern Europe certainly till about 400 B.C., whilst in Switzerland and Hungary it may have ceased about 600 B.C.

Dates of this description can only be approximately correct,

for however much the sequence of the three prehistoric periods of Stone, Bronze, and Iron may be regarded as undoubtedly proved for Europe and other large spheres of culture, so certain it is that the transition from one stage to another must have required a very long time. It is therefore impossible to fix chronologically the end of the Stone Age or the beginning of the Bronze Age, and the end of the latter or the beginning of the Iron Age. They dissolve like the colours of the spectrum, which, notwithstanding imperceptible transitions, must always remain indisputable, like the prehistoric system of the Three Periods.

10. The Hallstatt Period.

Whilst in some large territories of the earth bronze was instrumental in bringing about comparatively high degrees of culture, and the highly developed use of bronze articles prevented the expression of any desire for a better metal, we find that in others more rapid strides had been made, and a change effected in the ways and means of culture. Thus the warlike Assyrians, as their most ancient tribute-lists show, appreciated iron, and knew how to exploit it better than most civilised Eastern nations, and that to such a degree that bronze and copper had to suffer by it. This is accounted for not merely by the nature and warlike spirit of the people, but also by the opportune times, during which its great conquests took place, and by the propinquity of a vast and rich iron district, which in all ages was regarded as the cradle of metallurgy, and furnished the best metal. This is the region between the Caucasus, the Pontus, the Caspian Sea, the western slope of Iran, the plains of Mesopotamia, the Taurus, and the Highlands of Cappadocia. Here settled, amongst other nations acquainted with iron, the Pontian Chalybes, whose name was annexed by the Greeks to signify steel, and from whom the Greeks themselves acknowledge having learnt the art of mining, and producing and manufacturing iron.

Although iron was known in Egypt about 1500 B.C., it

certainly did not appear in Europe in any appreciable quantity neither at that time nor in the following centuries, as is proved by the finds in Troy, Tiryns, and Mycenæ. It is not until the ninth and eighth centuries B.C. that we suddenly find it in large quantities in the possession of Asiatic nations, as the Assyrian tribute-lists prove, and simultaneously, but not so frequently, in the layers of ancient European finds. At the same time the type of the first Iron Age of Europe, the Hallstatt type, shows clear distinctive marks of Oriental origin, so that in general we cannot be in any doubt as to whence this renaissance of many forms of our old Western sphere of culture is derived. To this must be added the opening up of extensive grave-fields in the Caucasus (Koban, &c.), belonging to the same period, and exhibiting the greatest possible "family likeness" to the cemeteries of the first Iron Age in Central Europe.

Altogether the Hallstatt culture is a phase of development which reaches further than the name leads us to imagine. But as it expresses more, and is more definite than the term "First Iron Age," we give it the preference, although not everything discovered in the Hallstatt area of finds is also found in the entire sphere of culture called by that name. With this limitation of the sense it may be taken that the sphere in question extends from the Caucasus to the Atlantic Ocean, and from the Mediterranean to the East Sea (North Sea or German Ocean). Consequently it covers almost the whole of Europe, and embraces chronologically the epochs of the first and half-historical appearance of the advanced European nations. At this particular period it is incontrovertibly proved that the Greeks, Italians, Etruscans, Celts, and Illyrians were settled in their historic homes. No one, indeed, doubts that the most ancient sacrificial gifts of Olympia are to be ascribed to the Hellenes, the grave-fields of Bologna, Corneto, &c., to the Italians and Etruscans, tumuli in the basin of the Rhone to the Celts, and the numerous grave-mounds of Bosnia to the Illyrians. Farther North, even in Hallstatt itself, it becomes doubtful to which

tribe the graves which are still preserved belong, and it is only in Northern Europe, where iron did not penetrate, but only certain forms and articles imported from the Hallstatt area, that we can again assume a Germanic population with any degree of certainty. In the same manner that we distinguish in the Bronze Culture countries with a short-lived duration of this phase of culture and others with a longer duration, so the area of the Hallstatt Culture is divided into regions with shorter and longer duration of this phase.

The countries with phases of shorter duration include Greece and Italy, where the first Iron Age only constitutes the transition to the historical epochs; those with a longer duration are the regions north of the Balkan Peninsula, the entire district of the Eastern Alps, Bavaria, Wurtemberg, Baden, Alsatia, Switzerland, the Franche-Comté, and Burgundy, *i.e.* the countries to which the name of the Hallstatt sphere of culture may be applied in a limited sense.

In these countries the first Iron Age lasted until 400 B.C., and was followed in the next few centuries by a period with new types and a more extended use of iron, in which the North of Europe now participated. It is this, the La Tène Age, which concludes the series of prehistoric periods of Central Europe, and forms the transition to the historic epochs, the first of which we recognise by finds and from written sources as the time of the Roman rule.

But also in those countries which possessed long periods of Hallstatt Culture the present was not one of rest. As we subdivide the Bronze Age into two stages with characteristic features, an undeveloped and a developed one, so we may distinguish two stages of the long Hallstatt period, and show the causes of this development. Many grave-fields in the districts of the Alps and the Danube offer the appearance of a mass of simultaneous burials without any distinguishing marks, especially the well-known field of flat graves on the Salzberg, near Hallstatt, in the Upper Austrian Salzkammergut, whence the following finds are derived (see Figs. 25–32, and 34–41, as well as the typical axe, Figs. 5 and 6).

The number of graves opened (all flat graves) amounted to several thousand, of which only about a thousand are better known. In about one-half of the graves there were found the remains of unburnt bodies, in the other half the remains

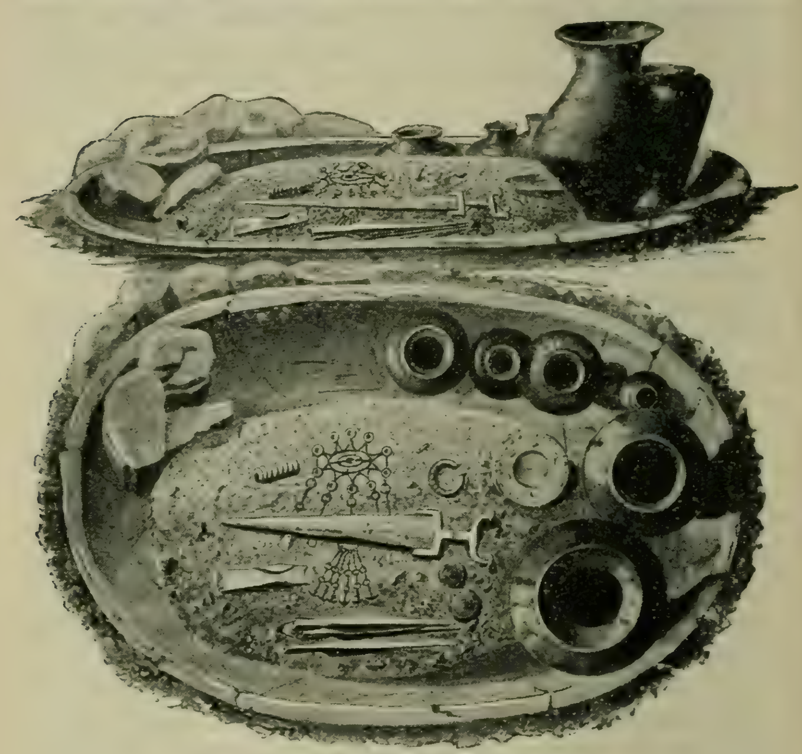


FIG. 25.—Grave (of a burnt body).

were all of burnt bodies. The difference in the mode of burial does not very much alter the nature of the "accompanying gifts." 525 graves containing skeletons yielded 18 weapons, 1543 ornaments, 37 parts of implements, and 33 vessels of bronze; 165 weapons, and 42 parts of implements of iron; 6 gold, 171 amber, and 41 glass ornaments; 342 clay vessels, 61 spinning-wheels, whetstones, and a few trifles. On the other hand there were 455 graves with the

remains of burnt bodies, which yielded 91 weapons, 1735 ornaments, 55 portions of implements, 179 vessels of bronze; 348 weapons, and 43 tools of iron; 59 gold, 106 amber, and 35 glass ornaments, 902 clay vessels, and 102 various trifles.

From this we gather that the graves containing the remains of burnt bodies were generally furnished with weapons, bronze and clay vessels in greater variety and quantity, whilst the skeleton graves contained more amber ornaments. Both show, however, that, at that time, iron was more frequently used in the manufacture of weapons and implements than bronze, but that the latter was preferred for various descriptions of vessels. Fig. 25 represents a grave and the ashes of a burnt body with the "accompanying—rather rich—gifts." The ashes are spread out on the bottom of a badly-baked, oval clay dish. Near the edge are a few clay and bronze vessels. On the ashes are weapons and ornaments, namely, an iron dagger with a bronze handle, several iron lance-heads, and one bronze palstab, then a pair of dress-hooks, one made of wire spirals in the form of a pair of spectacles, the other in curious filigree, cast and

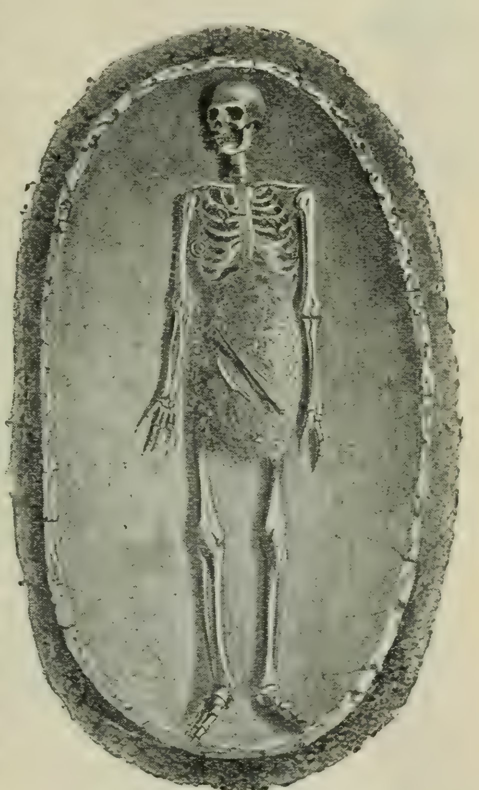


Fig. 26.—Skeleton Grave.

with pendants, finally a bracelet, and a few other articles. The grave belongs to the later Hallstatt period.

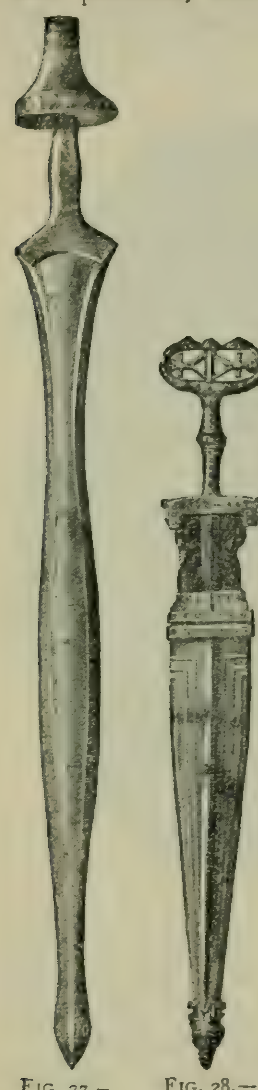


FIG. 27.—Bronze Sword.

FIG. 28.—Iron Dagger.

In Fig. 26 we have a similar clay dish with a skeleton and two dress-hooks. The ashes are spread over the middle portion of the body, and a knife and a spear-head belong to it. The skeletons found at Hallstatt point to a tribe of strong men, of middle stature, long heads, possibly of Keltic, probably of even Germanic origin, in any case of Aryan race. In the bronze vessels which, like those of clay, were only exceptionally used as ash-holders, there were frequently found bones of animals, *i.e.* remnants of food. Each grave contained from three to five vessels of clay. The graves were often surrounded and covered with stones.

Amongst the "accompanying gifts" the weapons are the chief objects which excite our interest.

Other graves of this period are not so richly equipped; some lack weapons altogether. But here we frequently find magnificent specimens of weapons of defence lying at the side of the dead. The long swords, the characteristic type of the earlier Hallstatt period, mostly show the form of Fig. 27 They are either of bronze or of iron. The former often have an ivory knob ornamented with amber. In the later period iron daggers with bronze handles and horse-shoe knobs are more

numerous. The handsomest dagger found in Hallstatt is represented in Fig. 28, which also shows the horse-shoe form. The lance-heads are of bronze or iron and also very numerous, whilst arrow-heads are rarer. We have already seen, in Figs. 5 and 6, the form of palstabs and celts; next to these we now and then meet with iron flat axes with small lappets which serve to fasten the blade to the shaft, and a few small bronze ornamental axes with



FIG. 29.—Bronze Helmet.

long loops, and the figure of an animal on the back of the axe. Helmets were not very numerous, and had broad horizontal brims, and sometimes (Fig. 29) two low combs or buckles to hold the feathers. A man's armour consisted, moreover, of various armour-plates, but no complete body-armour, and a broad leather girdle, with richly hammered bronze-work.

Among implements, knives take the first place. They are slender and elegantly curved, of bronze or iron, small, with the point bent downwards, or large and heavy, of iron,

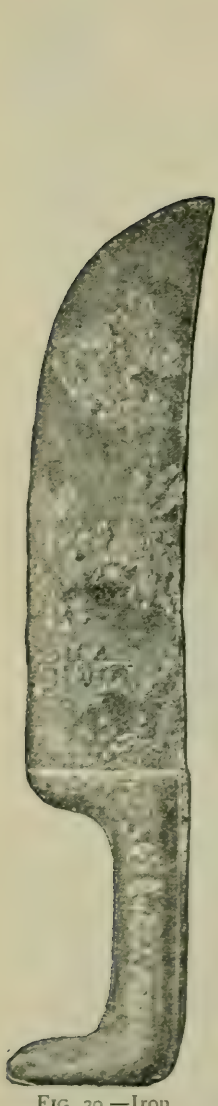


Fig. 30.—Iron Knife.



Fig. 31.—Whetstone.

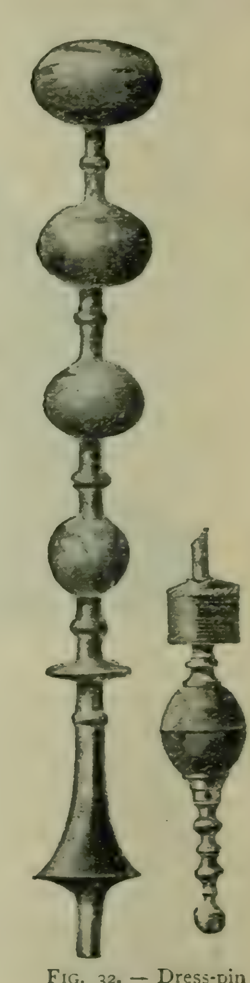


Fig. 32. — Dress-pin with Buttons and Point-protector.

and the point bent upwards (Fig. 30). Sharpening stones were generally worn (Fig. 31).

Then we find, here and there, ordinary tools, such as files, anvils, and similar articles, or objects of the toilet.

We have already remarked that ornaments appear in greater number than weapons and implements. This is a characteristic feature of nearly all prehistoric graves. In addition to the richly-ornamented girdles, already mentioned, which were also worn by women, we find that needles, pins, rings, and pendants were the most frequent. Much of it is native work, and, to judge by the pattern, also native invention. Women wore a comb made of simple pins, with



FIG. 33.—Boat-shaped Pin.

buttons in their back hair As dress-pins they had very prettily ornamented daggers, of great length, the point being protected by some bronze or bone device. Fig. 32 shows the head and point of a pin of this description.

For the purpose of fastening their dresses they used, here as well as in the entire region of the Hallstatt culture, spiral spring pins which consisted of a shoulder-piece or foot and a pin with a single or double spring-loop as a head-piece. In the earliest ages they were made in one length of wire, and in the course of time they assumed very different forms. In Hallstatt the most frequent pin is one with a shoulder-piece in the shape of the figure "eight," consisting of spiral wire discs, the centre of each forming respectively the needle and the needle-catch. In Fig. 25, representing the Ash-

grave, this Hallstatt pin lies next to the handle of the dagger. The other pins are more like those described above. The straight (bow-shaped) pin of the Bronze period developed, in the first instance, in the south of our continent, into the half-moon bow-pin with a short foot, which is a characteristic feature of the earlier Hallstatt period. At first it is a simple, bent and hammered piece of iron or bronze wire; it occurs later in cast bronze; in the South, in gold with rich shoulder ornamentation. Fig. 33 shows one already hollowed out in the form of a boat, the shoulder being engraved with zig-zag lines, with a long pin-rest, closed with a button. Pins of this description occur also in Greek graves of the seventh century in Sicily, and are not unfrequently found in the regions of the Alps as articles imported from Italy.



FIG. 34.—Engraved Crescent Pin with Rattle-plates.

Fig. 34, however, is a more faithful representation of the archetype, enriched, in barbarous fashion, by two figures of animals inside the bend of the pin, with the shoulder-piece extended and bent outwards in the form of a scythe, etched with short, trembling lines, and on the edge of it a row of little chains carrying wedge-shaped pieces of metal. These and similar enrichments of the prototype appear to belong to Norway, where we meet with some independent work in pin-varieties, but chiefly with imitations or models of South European origin.

The organic development of the pin led from the Bronze and Hallstatt period through the La Tène phase, and even over the Roman Age, into the period of the wanderings of the nations, to terminate late in the Middle Ages.

Amongst actual jewellery, the prevailing pattern for rings, especially bracelets, was an elegant knot, but otherwise heavy (Fig. 35) with pendants. The latter, often of the most grotesque shape, are always fitted on where there happens to be room for them, and where their continual jingle may produce a not unmelodious sound.



FIG. 35.—Armlet with Knots.

Dresses are also sewn with bronze buttons (which elsewhere were stuck in rows on clay pottery), and rolls of spiral wire and pearls are strung on strings and hung round the neck. Glass enamel pearls, and especially pearls and thick rings of amber play a great part here. Glass and amber are also fixed on to the shoulder-pieces of pins. Altogether, the love of display shown by primitive man, who gladly exchanges his valuable earth-products for the glass-corals and glitter of the "white man," is a conspicuous feature in the character of the Hallstatt period, which, however, fittingly retreats into the background in the La Tène period, in which the self-respect of the savage awakens.

Intercourse with the advanced South, however, brought to these people not only forms of pins and all manner of glittering rubbish, but also better and more important articles; for instance, rivet-work of thin bronze plates which they soon learnt to use in the manufacture of costly vessels. Figs. 36–40 represent some of them in metal.

The vessels shown in Figs. 36–38 are probably imported Italian ware, whilst Figs. 39 and 40 may be regarded as native work. In the earlier Hallstatt period they probably had imported vessels of this description only, ornamented with hammered circles and figures of animals; the production of native work did not take place till the



FIG. 36.—Bronze Basin.

later period. Of the ribbed, cylindrical vessels those with narrower circlets (Fig. 38) are an older Italian form produced near Bologna, whilst those with close ribs (Fig. 40) belong to the Illyrian tribes living more to the North, and, in point of time, to the end of the fifth century B.C. The deep basins (Figs. 36 and 39) afford examples of the simple, straight-lined geometrical ornaments which were in

vogue and executed with the graver. The "Cista" in Fig. 38, on the other hand, shows hammered pattern-ornamentation. They were very skilful in the art of hammering metals, but as yet ignorant of the art of soldering, which accounts for the manner of joining the various



FIG. 37.—Bronze Vase, in four parts.

parts of vessels by means of bending and riveting the metal (Fig. 37).

The art of casting flourished, but Fig. 41 shows how little they understood how to model figures, the bull, in this instance, having a very thick tail, possibly as a mark of its breed, but perhaps only the result of the clumsiness of the designer. Other, more elaborate, hammered and engraved figures of animals on bronze vessels or girdles, frequent in Alpine countries, are derived, almost without exception, from Upper Italy, where a peculiar, heavy style, but becoming

firmer by practice, prevailed in the execution of such work. An example is given in Fig. 42, which represents a bronze pail from Kuffarn in Lower Austria, from a grave of the time of the transition from the Hallstatt to the La Tène period. The subject is an encounter between two men for a helmet as the prize, a race for riders, one for chariots, and a banquet, all festal scenes.

Pottery in the Hallstatt period competes not unfavourably with the manufacture of vessels in bronze, the chief products being articles for special use (in graves), urns with bulging bodies and long necks, with graphite polish; large vases in the form of bombs with short necks and black geometrical figuring on a red ground, dishes and cups with beautiful internal decorations, white being sometimes inlaid to show the rich painting to better advantage. Even this sober industry frequently assumes a fantastic character and produces handles with heads of animals, or little birds made to form small dishes on larger ones, as in Fig. 43, where a two-headed animal is seen inside the dish. This is from a mound-grave in Oedenburg. Of course this cannot have served any practical purpose, and, as a matter of fact, the vessels in daily use are always of a simpler and more convenient form.



Fig. 38.—Wide-ribbed Cista of hammered bronze.

During the whole of this period the potter's wheel

was unknown, and in the later Hallstatt period we only rarely meet with differently formed clay pottery, ornamented and turned, and then as articles imported from Southern countries in which at about this time the Hall-



FIG. 39.—Bronze Basin with turned handles.

statt period and with it the whole Prehistoric Age came to an end.

The later stage of the Hallstatt period, brilliant examples of which in Western Germany are the so-called "Princes' Sepulchres" of Hundersingen and Ludwigsburg in Wurtemberg, may be recognised, as far as our proofs go, by the increased importation from the South and generally by an increased intercourse and traffic.

Originally common to the South and to our own con-

tinent, the Hallstatt culture lasted longer with us, but it was affected by Southern influence. The ruling position of Italy towards Central Europe in the Hallstatt period began about the year 500 B.C. The wealth of certain countries in salt and gold, the most prized treasures of the earth, the abundance of cattle and field-fruits in other regions, and last, but not least, the great commercial roads through the Alps, are the chief factors which produced these influences and which brought together the vast collection of objects yielded up to the light of day by the graves of their mouldering owners.

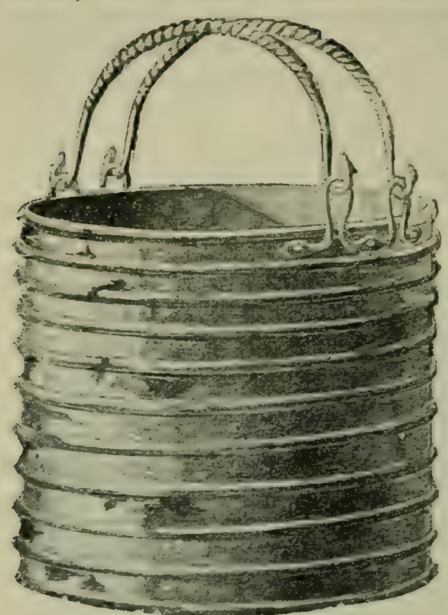


FIG. 40.—Narrow-ribbed Cista.

11. The La Tène Period.

When vast groups or races of men are removed from the sphere of prehistoric culture and enter upon historic paths, it has the result of gradually narrowing down the area of the later phases of primitive archæology, traces of which we encounter in our own country, and the extent of which it is our aim and object to ascertain. In a certain sense, therefore, the whole world has had a Stone Age. The Bronze Age is also found in vast regions of the Old and New World. But as regards the Hallstatt period we must confine ourselves to Europe, and as far as the La Tène period

is concerned we must even leave out Greece and Italy, with the exception of the plains of the Po. As an equivalent, this culture has conquered Northern Europe, whither the Hallstatt culture could not penetrate, or at least only in weak off-shoots.

We have noticed in former chapters how the western nations were vouchsafed a longer rest. They became ac-



Fig. 41.—Cast Figure of an Ox in Bronze.

quainted with new forms of life by the influences of the East and the South, and have passed through all those movements which have affected the culture of the prehistoric inhabitants of the continent ever since the later Stone Age. But they took no share in the work of development.

By the nature of their place in the world they could neither be the first to receive Oriental influences nor disseminate their results further westwards.

But this long rest gave late but marked strength to the Keltic tribe to stand forth with that peculiar phase of culture which left its impress on the last centuries previous

to the conquest of Gaul and the lands of the Alps by the Romans. The La Tène culture, which suddenly ruled all Europe with the exception of the ancient classical area, is the culture of the Kelts in the form it developed at the time when this highly gifted Aryan race, mighty in number, bold in spirit, advanced in the knowledge of metals and in possession of numerous technical and other aids, conquered vast territories of the earth. Upper Italy, the Rhine, the countries of the Danube, and the whole zone of the Alps with a portion of the Balkan Peninsula became the spoil of the Keltic hordes who everywhere instituted their own kings and nobles.



FIG. 42.—Bronze Pail.

Indeed even Asia Minor was flooded by the "Galatians" hordes of the Trokmers, Tektosags, and Tolistobojans, who established a savage kingdom in the very midst of Greeks and Hellenised Asiatics.

As the Hallstatt culture, on close examination, dissolved itself into various elements among which we recognise traces of the Bronze Age, direct gifts from the East, independent additions, and finally influences of the Etruscan conquest of

Northern Italy, so the La Tène culture exhibits different roots. Greek influences (ancient Ionian?), Oriental (Carthaginian?), and Italian (Etruscanizing) seem to have participated in their development.

Moreover, there are undeniable and intelligible traditions of the Hallstatt period in it.

The principal and most important factor is the later origin of this phase of culture, because it explains the quasi-"modern" character by which it takes its just place in the



FIG. 43.—Clay Dish with flat and raised ornaments.

proper course of the development of mankind in Europe, but primitive archæology points with certainty to the fact that at the time of the Hellenisation of the East, and the first spread of Roman dominion over the northern nations of Europe, a phase of culture had been inaugurated which should be regarded as a worthy preliminary stage of the Roman provincial culture. Indeed, the latter culture in the Rhine and Danubian provinces arose for the most part from the very lap of the La Tène culture, and appears in more than one form as a simple continuation of it.

The culture of La Tène, like that of Hallstatt, derives its name from the celebrated discoveries made at that place. La Tène (*i.e.* "the great depths") is the name of a spot

near the village of Marin, to the north of the Neuenburger See (lake) in Switzerland, where, on the ruins of an island stronghold in the form of a block-house, they found a mass of iron weapons, implements, vessels, and jewellery, differing both from Hallstatt and Roman articles of the same description. Here there are no more bronze swords, axes, or lance-heads. The swords, of which there are a hundred, one metre in length, are all of iron, broad from the top to the point, double-edged, with simple angle-bar handles, without any artistic or decorated knobs. The blades of these swords consisted each of two iron or bronze strips. The form of the lance-heads is new, as is shown either by the width of the strips of metal or by the length of the shaft, which is without strips.

The latter belong to javelins similar to the Roman pilum. Arrow-heads are rarer, and daggers altogether missing. Daggers and arrows are, in a manner, unheroic weapons, despised by the manly Kelts, who carried long crooked knives, large iron-bound shields, iron or bronze sword-chains, and open necklets, which, among the "aristocracy" or well-known fighters, were of gold, and are recognised by the stamp-shaped ends. Their helmets—which are less frequent than in the Hallstatt period—are also differently formed, being rather pointed at the top, decorated with a knob, and provided with a small brim and cheek-lappets. Sometimes in Keltic graves and other localities of finds, for instance in La Tène, we discover relics of rich harness and war-chariots in which the Gauls went into battle.

But the Keltic weapons, the heavy blows of which rained upon the Romans in many a sanguinary battle, are not the only objects which indicate this degree of culture and claim our respect; the implements and tools of the Kelts also call for our genuine appreciation. Their knives, shears, sickles, scythes, hoes, rakes, axes, and ploughs are partly new and partly after old patterns, but the underlying principle is that of utility. Articles of iron are without ornament, but well and substantially made. The stamp upon them shows that

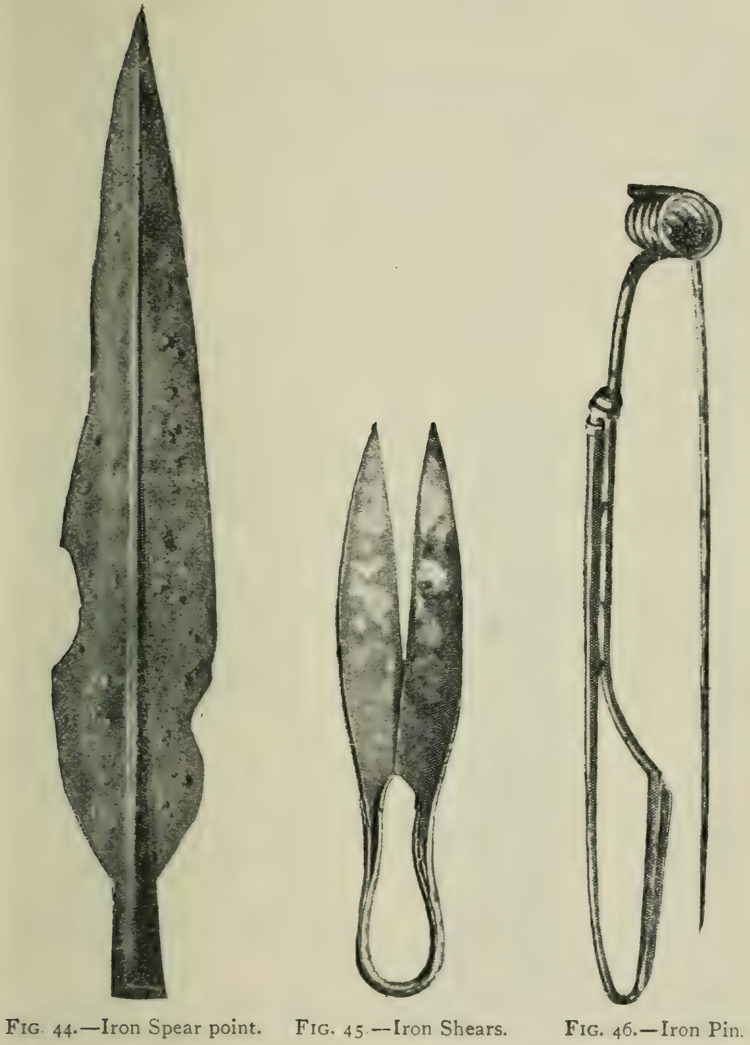


FIG. 44.—Iron Spear point. FIG. 45.—Iron Shears. FIG. 46.—Iron Pin.

they were produced in a factory. Amongst other novelties they possessed were potters' wheels, potters' ovens, rotatory corn-mills, coined gold and silver imitations of Massaliotic and Macedonian impressions, the obverse and reverse of which were at first faithfully reproduced, but later on replaced by a system of ornamental lines, and finally dice (formerly unknown) and playing-stones, like dominoes. There was, however, a retrograde movement in the manufacture of vessels of bronze, which were made after old patterns not true to style, or imported ready-made from Italy (the so-called "beaker-cans").

The ornaments of this period were of less independent form, and not chiefly for personal adornment, as in the Hallstatt Age, but rather for the decoration of articles of daily use, which they consequently followed in point of form. Quite new ornaments are plants, which were rather clumsy, but of classical type. The style of the La Tène period includes figures of animals with arabesques and flourishes, masks of human faces, triquetra with unrolled ends, double volutes, and the so-called "fish-bladder pattern." In this manner they decorated sword-blades, vessels, chains, rings, helmets, pins, and similar articles. Enamel or blood-glass, used in filling out deeply-cut lines of decoration, is also a novelty, as well as inlaying bronze with coral or tablets of paste.

England and France, the chief seats of the Keltic art of enamelling (for instance, Mont Benvray, near Autun), yield specimens of enamelled bronze shields, pins, necklets, helmets, spurs, sword-sheaths, bits, and belt-buckles, &c.

It is here only necessary to touch upon the advantage which accrued to the Keltic workman from the fact that this nation was a town-building one, and did not live, like the German, in isolated settlements.

Of the remaining illustrations, Figs. 44–46 represent a few articles from La Tène, a typical lance-point, a pair of shears like our sheep-shears (the latter being frequently found in graves), and a pin. The characteristic feature of

the La Tène pin, which is made of iron or bronze, in Hungary of silver, is the double-sided spiral-winding of the feathering "head," and, more especially, the extension of the pin-gulley, which is bent back towards the shoulder-piece, and was at first unconnected, but afterwards joined to the shoulders. This development is already foreshadowed in the latest forms of the Hallstatt pins, and constitutes the prototype of many Roman provincial pins.

The so-called "Animal's Head Pin" is a peculiar form of pin of the early La Tène period, but only occurs in a very limited area.

Fig. 47 shows us one of the most important productions of which the ever-subordinate, creative art of pre-Roman culture was capable, the highest flight to which it could soar; it is a small bronze figure of a savage warrior in closely-fitting tunic and old-fashioned helmet, with arm and leg bracelets. The position of the arms is not very clear, as the articles probably held in the hands are missing. The warrior was evidently holding a sword blade perpendicularly in his hand and allowing his eye to glance along its edge.



FIG. 47.—Bronze Figure of a warrior.

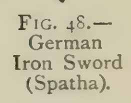


FIG. 48.—German Iron Sword (Spatha).

Fig. 48 represents an object of later date, the "Spatha," a long iron sword of the Germans. It agrees,

in point of form, so clearly with the sword of the last La Tène period that it can readily be understood how the Germans formed their weapons of defence (for their knights) after the model of Keltic wrought work.

With the spread of ancient classical culture to the Rhine, the Danube, and even far beyond, the realism of the less valuable but higher art of the barbarians began to droop and perish, paving the way for the entry of the ideal though shallow and faded forms of art of a southern sphere of culture.

But, with some little modification, the technical and industrial forms and methods of treatment of the last Preclassical Period were preserved, in testimony of their innate vitality.

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